



WG 113 B112y 1924

38110110R



NLM 05187638 0

NATIONAL LIBRARY OF MEDICINE

SURGEON GENERAL'S OFFICE  
LIBRARY.

Section *Heart*

No. 113,  
W. D. S. G. O.

No. *257565*

3-513



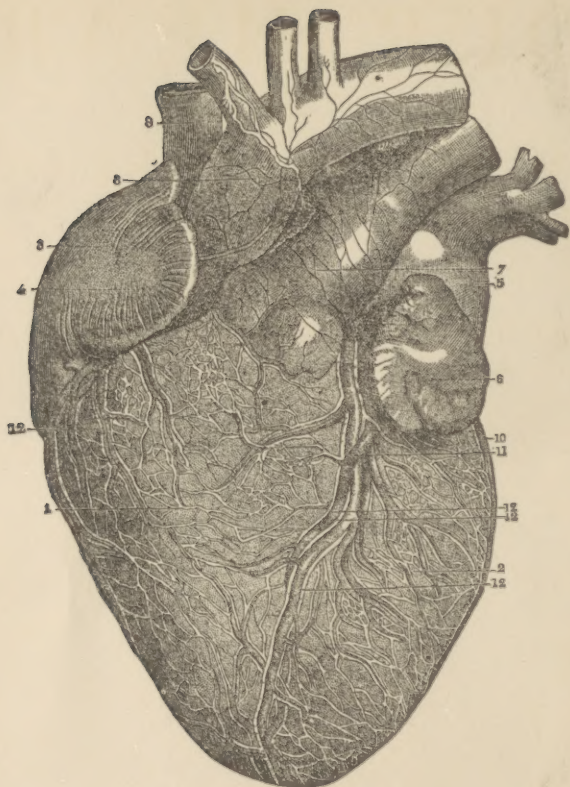




YOUR HEART  
AND  
HOW TO TAKE CARE OF IT







HEART, ANTERIOR VIEW. (BONAMY AND BEAU.) 1, right ventricle; 2, left ventricle; 3, 4, right auricle; 5, 6, left auricle; 7, pulmonary artery; 8, aorta; 9, superior vena cava; 10, anterior coronary artery; 11, branch of the coronary vein; 12, lymphatic vessels.

# YOUR HEART

AND

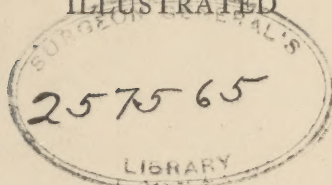
## HOW TO TAKE CARE OF IT

BY

ROBERT H. <sup>all</sup>BABCOCK, M.D., LL.D.



ILLUSTRATED



D. APPLETON AND COMPANY  
NEW YORK :: 1924 :: LONDON

LIBRARY U. S. SURGEON  
GENERAL'S OFFICE



WG  
113  
Bilby  
1924

file # 3036, no. 2

COPYRIGHT, 1924, BY  
D. APPLETON AND COMPANY

Copyright, 1918, by George H. Doran Company  
PRINTED IN THE UNITED STATES OF AMERICA

THIS  
LITTLE BOOK IS  
DEDICATED IN LOVE AND  
GRATITUDE TO THE MEMORY OF  
MY BELOVED PARENTS—TO MY UNSELFISH  
FATHER, WHOSE EVER-READY GENEROSITY EN-  
ABLED ME TO PURSUE STUDIES IN THIS COUNTRY AND  
ABROAD WHICH LED UP TO THE EXPERIENCE ON WHICH THE  
MATERIAL FOR THESE CHAPTERS IS FOUNDED; TO MY  
MOTHER, WHOSE FAR-SIGHTED JUDGMENT ENABLED  
HER TO SEE WHAT WAS NECESSARY IF  
HER SON, HANDICAPPED AS HE  
WAS, COULD ACCOMPLISH  
ANY USEFUL WORK  
IN LIFE



## FOREWORD

**T**HIRTY years of professional work has brought me in touch with hundreds of children whose outlook on life has been darkened and even eclipsed by ailments that seemed to me largely if not wholly preventable. Also there have been among my patients many, very many adults of both sexes who could have been spared irremediable suffering both for themselves and their dear ones had they only been made aware in early years of the disastrous pace at which they were living or of the inevitable toll they were to pay for violation of the laws of health as regarded their hearts. In the hope, therefore, that what is said in the succeeding pages may save some persons from preventable invalidism or even death, this modest contribution to the cause of disease-prevention is submitted to the public and perchance to the criticism of my colleagues in the Profession of Medicine. That there are faults and omissions I am quite conscious, but whatever its demerits my aim and desire have been solely to help my fellow beings.



# CONTENTS

| CHAPTER                                                                                                                                                                                                      | PAGE |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <b>I</b> <b>INTRODUCTORY</b> . . . . .                                                                                                                                                                       | 17   |
| How your habits and mode of life may<br>affect your heart. Symptoms and sensa-<br>tions that do or do not mean heart disease.<br>The child. The busy man of affairs. The<br>strenuous society or club woman. |      |
| <b>II</b> <b>THE HEART AND BLOOD VESSELS</b> . . . . .                                                                                                                                                       | 22   |
| Facts about your most vital organ you owe<br>it to yourself to know.                                                                                                                                         |      |
| <b>III</b> <b>THE CIRCULATION AND ACTION OF THE HEART</b>                                                                                                                                                    | 39   |
| What makes your heart beat and go on<br>beating.                                                                                                                                                             |      |
| <b>IV</b> <b>THE HEART SOUNDS—THE PULSE AND BLOOD<br/>PRESSURE—EXERCISE AND THE HEART</b> .                                                                                                                  | 50   |
| <b>V</b> <b>WHAT DO WE UNDERSTAND BY HEART DIS-<br/>EASE?</b> . . . . .                                                                                                                                      | 62   |
| <b>VI</b> <b>INFECTIONS AND THE HEART</b> . . . . .                                                                                                                                                          | 83   |
| Tonsilitis, Pyorrhœa, Appendicitis, Pneu-<br>monia, Scarlet Fever, Rheumatism, Etc.                                                                                                                          |      |
| <b>VII</b> <b>RHEUMATISM AND THE HEART</b> . . . . .                                                                                                                                                         | 93   |
| Prevalence in Childhood.                                                                                                                                                                                     |      |



| CHAPTER                                                                                                                                           | PAGE |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------|
| VIII WHAT CAN BE DONE TOWARD PREVENTING<br>HEART DISEASE DUE TO INFECTION? . . .                                                                  | 109  |
| Forewarned is forearmed. Facts all too<br>little known.                                                                                           |      |
| IX WHY THERE IS SO MUCH HEART DISEASE AT<br>MIDDLE AGE . . . . .                                                                                  | 123  |
| What to do when injury has already been<br>suffered. Alcohol and tobacco. Strenuous-<br>ity and luxury. Worry. Over-eating.<br>Constipation, Etc. |      |
| X SYMPTOMS ABOUT WHICH YOU DO NOT NEED<br>TO WORRY . . . . .                                                                                      | 142  |
| XI SYMPTOMS TO WHICH YOU SHOULD GIVE HEED                                                                                                         | 155  |
| Shortness of Breath. Pains. Swelling of<br>the Ankles. Increased Urination. Nerv-<br>ousness, Etc.                                                |      |
| XII IS IT SERIOUS, DOCTOR? CAN IT BE CURED?                                                                                                       | 170  |
| XIII HOW TO TAKE CARE OF THE HEART . . . .                                                                                                        | 186  |
| Exercise. Swimming. Bursts of Speed.<br>Walking. Golf. Dancing. Automobile<br>Driving. Horseback Riding.                                          |      |
| XIV CARE OF THE HEART (CONTINUED) . . . .                                                                                                         | 206  |
| Occupations. Marriage. Diet. Water.<br>Baths. Habits. Sexual Indulgence.                                                                          |      |
| XV THE USE OF REMEDIES . . . . .                                                                                                                  | 229  |

## ILLUSTRATIONS

|                                                                                                                        |                     |
|------------------------------------------------------------------------------------------------------------------------|---------------------|
| HEART, ANTERIOR VIEW . . .                                                                                             | <i>Frontispiece</i> |
|                                                                                                                        | PAGE                |
| SHOWING POSITION OF THE HEART WITHIN THE<br>CHEST . . . . .                                                            | 25                  |
| SHOWING DIFFERENT CHAMBERS OF THE HEART<br>AND ATTACHED BLOOD VESSELS . . . . .                                        | 29                  |
| INTERIOR OF LEFT VENTRICLE, SHOWING BUTTON-<br>HOLE MITRAL SLIT . . . . .                                              | 69                  |
| EXTERNAL APPEARANCE OF LARGE ANEURYSM OF<br>ASCENDING AORTA . . . . .                                                  | 75                  |
| SHOWING COMBINED HYPERTROPHY AND DILATA-<br>TION OF BOTH VENTRICLES AND THE HEART AS IT<br>WOULD BE NORMALLY . . . . . | 79                  |



# YOUR HEART AND HOW TO TAKE CARE OF IT

## CHAPTER I

### INTRODUCTORY

**W**HAT do you know about the heart and how to protect your heart from injury so as to reach a healthy, happy old age? Do you know the makeup of the heart? Do you know how it works and what laws govern its work? What do you know concerning the blood vessels any more perchance than that there are arteries and veins? What do you know about the blood and what about its property of protecting the body against infectious disease? And do you know what is meant by infections or how infections may cause disease of the heart or blood vessels? Have you any very clear notion as to how your habits and your mode of life may affect your heart or what may be the harm of obesity and in particular the harm that comes from great abdominal corpu-

## 18 Your Heart and How to Take Care of It

lence? And if perhaps you have been told or suspect that you have a weak heart, do you know how to protect it from still greater weakness? Do you know really what symptoms or sensations mean heart disease and what do not? In short, do you really know anything clear and definite about the one organ on which the healthy, orderly function of your other organs depends, or are you going on in ignorance of the laws of health and in very much the same spirit as does the ostrich which hides its head in the sand and fancies it is safe? Or are you like so many foolish persons afraid to go to a physician for examination and advice lest he may tell you that your bodily machinery is wearing out in places and needs to be spared some of the things you love and are unwilling to give up?

Perhaps you are not troubled about your own heart but are a parent or other guardian of little children. If so, you will find in these pages very helpful guidance for protection against some of the apparently petty illnesses that render young and tender little folk liable to inflammation of the heart. Only a physician has any conception of the amount of heart disease among children or the number of grown ups whose physical disability dates back to childhood and the diseases so common at that time of life.

If on the other hand you are a person of middle age you will find in the following chapters information that should interest you, for disease of the heart and blood vessels is on the increase and some of the causes are certainly preventable. It may be that you are already feeling the injurious effects of some of these influences, and if so, you should learn what you can do to retard or minimise their effects. Should you be a busy man of affairs in the prime of life and usefulness you should know what dangers may be ahead of you. Or in case you are an anxious, hard working wife, housekeeper or ambitious, strenuous society or club woman this little book will show you how injurious to the heart is worry and that feeling of hurry under which some nervous, steam engine sort of women do everything and why it is not well to keep perpetually driving the circulatory machinery to the topnotch of speed. And remember all this is written not to frighten but to warn and instruct you, and read in this spirit these pages should prove well worth the time spent on them.

It is the aim of this little book to give you information on these and other points which may enable you to take care of your health and that of your dear ones, that you or they may in some measure at least escape some of the ills that not

only shorten life but do so perchance just when youth is blossoming into full maturity or when the man or woman is beginning to reap the harvest for which years of hard work have been planting.

You need not fear that what is to be said will frighten you or teach you to fasten your attention on your heart, making you thereby introspective and hypochondriacal. That would be sad indeed! Quite the contrary! It is hoped to so enlighten you that should you already have been told you have something wrong with your vital pump or should you happen to experience unusual sensations in the chest in the region of your heart you may not be unduly alarmed. One great province of the physician, if indeed it be not his greatest duty, is to strive to prevent disease and hence the Medical Profession is approving of proper attempts to give the Public such information as will help in the avoidance of disease that is preventable. It is in this spirit therefore that this book is written. Many of the ills that afflict mankind are unavoidable perhaps, certainly in the present state of human knowledge, and this applies doubtless to some of the diseases of the heart and blood vessels now so prevalent. At all events, if they are all preventable we do not yet know how to bring about



this desirable result. Nevertheless much of the suffering and death now due to heart disease is preventable; how much of this may be accomplished it is hoped to set forth in simple language.

## CHAPTER II

### THE HEART AND BLOOD VESSELS

**I**T is not intended in this chapter to give a minute description of the heart and of the physiology of the circulation, but only to mention certain facts which persons who have not studied physiology should know if they are to understand the matter aimed to be set forth in this little book. It is often surprising to find how ignorant individuals show themselves to be regarding their own bodies who on other subjects are highly intelligent people. And since much of the disease and suffering of humanity might be avoided by a knowledge of the working of the bodily organs and of the influences that derange them, it is hoped this chapter and the ones to follow may serve a useful purpose.

The heart is often likened to a pump and the blood vessels to a set of pipes into which water is thrown by the pump. This is a very rough and imperfect comparison, for a pump and set of pipes constructed of iron or wood are rigid and unyielding, whereas the heart and blood vessels

are elastic and yielding. Moreover the human pump is not placed at the beginning or end of the blood vessels but is placed in the centre of them, so to speak, and in reality is but a highly developed and organised part of the whole circulatory apparatus. Therefore the heart and blood vessels have to work together in perfect harmony or the whole system is disturbed.

Another very essential difference between the human and the man-made pumping system is found in the fact that the latter because of its rigidity throws a stream of water in spurts or jets, whereas the elasticity of the heart and blood vessels maintains a constant pressure on the blood and thus forces it along in a steadily flowing stream.

The heart is a hollow muscle that has the power of contracting like any other muscle, but unlike the muscles of the arms or legs, for instance, it is not under the control of the will. It is not, on this account, a so-called voluntary muscle but an involuntary one and contracts regularly and automatically while the person is asleep as well as when he is awake. It may be said, therefore, to be the one organ that never sleeps and is never free from work. Because of its being a hollow muscle it acts as a pump, receiving and discharging blood as does any pump. Its shape is some-

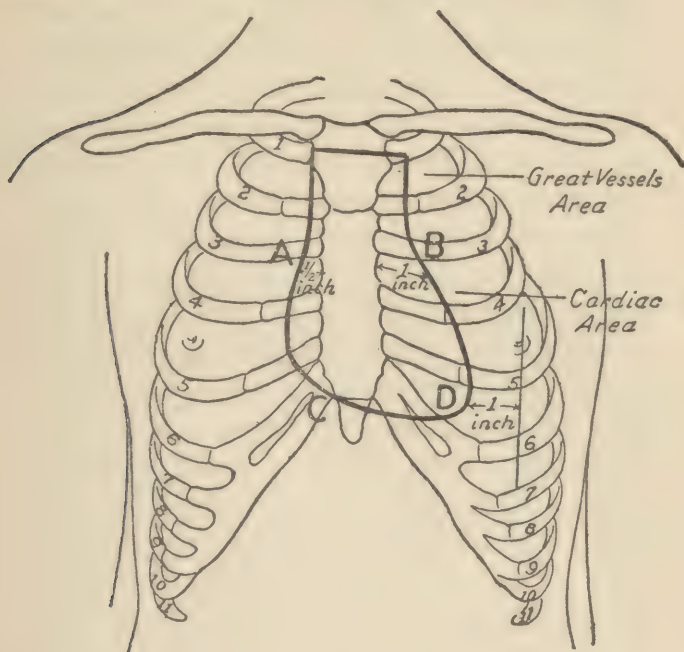
## 24 Your Heart and How to Take Care of It

what like that of a pear, its point or apex lying low in the chest and about three inches to the left of the middle line of the chest (see Figure 1), so that the heart strikes the wall of the chest between the fifth and sixth ribs on the left side and slightly inside the left nipple.

The rather broad upper part of the heart lies high up behind the breast-bone at the level of the space between the second and third ribs and here is suspended or held by certain large blood vessels, to be mentioned hereafter. The interior of this remarkable organ is divided by a longitudinal and a transverse partition into four cavities or chambers (see Figure 2), of which the two above, known as auricles, receive the blood returning to the heart, while the two toward the apex, known as ventricles, discharge the blood into two arteries that then distribute it to all parts of the body.

Furthermore the heart is enclosed by a bag which because it surrounds the organ is called the pericardial sac, and that the heart may contract and expand without friction this bag or pericardium is lined with a wonderfully smooth membrane kept slightly moistened by the serum of the blood and hence is spoken of as a serous membrane.

On the inside this hollow muscle is lined by a beautifully smooth membrane called the endocar-



*Figure 1*—SHOWING POSITION OF THE HEART WITHIN THE CHEST.



dium on account of its being within the heart, endo meaning within and cardium meaning the heart. This endocardium is continuous with the lining membrane of the blood vessels, to be spoken of later. Then there are four openings in the heart that it is most important to remember; namely, two communicating between the two receiving chambers or auricles, and the ventricles, one on the right side and one on the left, named respectively tricuspid and mitral because of the number and shape of the valves that open and close these openings. The valve on the right side has three leaflets or cusps and hence is termed tricuspid, while the one on the left side having but two cusps or leaflets is called mitral from its resemblance to a bishop's mitre.

The two other openings that permit the discharge of blood are situated in the wall or muscle of the ventricles and received their names from the vessels into which they open. Thus the one in the right ventricle is known as the pulmonary orifice because it opens into the pulmonary or lung artery, while the one in the wall of the left ventricle because it leads into the great artery, termed aorta, is designated the aortic orifice or opening (see Figure 2). The valves guarding these two openings bear the same name as their respective orifices, that is, the pulmonary and



aortic valves. The openings that permit the flow of blood into the two auricles out of the vessels bringing blood to the heart have no valves and do not concern us here.

Consequently the structures to be remembered in order to understand both the working and the diseases of this wonderful pump are the muscle or wall of the heart termed myocardium, the membrane enclosing this muscle called the pericardium, and the endocardium or the membrane lining the heart, and the four sets of openings and valves, namely, tricuspid, mitral, pulmonary and aortic.

As previously stated, the heart forms but a part of the circulatory system which now must be described. Three kinds of blood vessels conduct the blood to every organ and tissue of the body, even into the muscle of the heart itself, for its nutrition and repair. They consist of arteries, veins and capillaries. The first named are highly elastic and contractile, having a layer of muscle fibres for their middle coat which like the muscle of the heart is enclosed within an outer and an inner coat, the outer one being fibrous and strong and the inner one or lining being very smooth like the endocardium. By reason of their contractility these vessels expel their contents after death, and being found empty by old anatomists, before William Harvey's discovery of the circulation, they

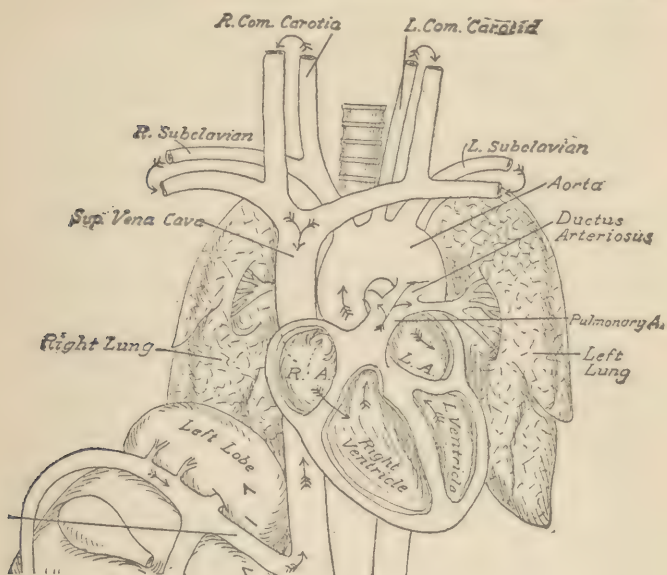


Figure 2—SHOWING DIFFERENT CHAMBERS OF THE HEART AND ATTACHED BLOOD VESSELS.



were supposed to carry air and hence were called arteries. In their distribution throughout the body they may be compared to a tree. That is, the trunk or main artery is the aorta which is attached to or arises from the upper part of the left ventricle (see Figure No. 2 and frontispiece) and takes a peculiar arching course upward toward the right border of the breastbone behind which it lies, then makes a turn to the left and after crossing to the left side of the breastbone makes another turn downward and backward and descends at the back part of the chest into the abdomen where it divides into two large branches that carry blood to the legs. Throughout their course the arteries keep sending off branches which divide and subdivide innumera- bly, growing smaller and smaller with each subdivision until at length terminal arteries are reached which on account of their small diameter are called arterioles.

The system of arteries thus briefly described carries blood from the central pump, the heart, toward the periphery of the body and the veins bring it back again. But interposed between these two sets of vessels are minute ones known as capillaries because of their resemblance in size to hairs. Small as are these capillary vessels, they yet play a most important part in carrying on the circulation, for they are like a vast system of

canals communicating between two rushing rivers and serve to maintain a steady flow of nourishing, life-giving blood to the tissues of the body.

A stoppage in capillary flow from any cause works disaster to the heart unless speedily removed. It is shown by blueness of the skin or lips of an individual and is to be regarded a sign of danger. It may be seen for instance in some swimmers who have been too long in the water and it is this paralysis of the capillary circulation that every now and then causes a person to drown from a cramp as is reported, whereas in reality the drowning is due to heart failure from sheer inability of the heart to force the blood through the paralysed and over-distended capillaries.

The veins into which the vast network of capillaries merges, beginning as venules or very narrow veins, increase in diameter from the circumference toward the centre of this marvellous and yet simple apparatus for carrying on the circulation. By this simple arrangement the flow of the dark or venous blood is facilitated until it finally is emptied into the right half of the heart by two great veins, of which the inferior vena cava brings blood from the lower extremities and trunk, while the superior vena cava receives blood returning from the arms and upper part of the body. Close

to the right auricle these two great veins join (see Figure No. 2) and pour their united stream into this receiving chamber.

Veins are not so strong and elastic as are arteries and hence are less resisting to internal pressure from the blood stream. This explains why in the lower extremities in particular they may stretch and form what are known as varicose veins, a condition that not only occasions pain but which favours clotting of the blood within them. They may actually stand out as great bluish knots or bunches. As if nature would guard against this liability to over-distension, the veins are provided with valves which are in reality but a fold of the inside lining and projecting from the side toward the centre serve as a sort of cup and thus intercept the blood in its tendency, through the force of gravity, to recede toward the periphery instead of flowing steadily as designated toward the ultimate goal, the right side of the heart.

Thus there is a complex network of blood vessels that, ramifying in every part of the body, leaves no organ or tissue unsupplied with channels through which may circulate the life-giving stream. In the arteries, on the one hand, this current carries oxygen and material for growth and repair, and, on the other hand, in the veins



returns carbonic acid and other products of waste for purification and oxygenation in the lungs.

Lastly, all classes of blood vessels are furnished with tiny vessels in turn known as *vasa vasorum*, whose function is to conduct blood and nutrient materials into the coats of the main vascular system. Otherwise these would soon perish from lack of sustenance. Furthermore, the blood vessels are supplied with two sets of nerves, of which one called trophic nerves regulate their nutrition and repair, while the other, known as vasomotor nerves, stimulate them to contraction or dilatation, as necessity requires.

The heart likewise is richly supplied with blood vessels and nerves, for a hard-working organ as is this pump can not go unfurnished with ample means for nutrition and regulation of its function. Just outside the left ventricle at the very beginning of the aorta are two offshoots or branches which pierce the right and left sides of the heart respectively and, dividing and subdividing into innumerable branches, carry arterial or red blood to every portion of the heart. They are termed coronary arteries (see frontispiece) because they encircle the base of the organ something like a crown. As with arteries in other parts of the body, most of the fine coronary twigs merge into capillaries and these again into



veins which, increasing in size as they near the base of the heart, finally empty their contents into the right auricle to mix with the stream coming from the general venous system.

Two sets of nerves send filaments to the heart. One is known as the *pneumogastric nerve* from the fact that it supplies likewise the lungs, stomach and digestive organs. This is the inhibitory nerve of the heart, so called because when stimulated by toxic substances produced within the body or taken in from without or when irritated experimentally, as with electricity, this nerve slows down and can even stop the heart from beating altogether. It is the action of this nerve which under the effect of grief, fear or other shock now and then brings a weakened heart to a permanent standstill with, of course, death of the individual. It is this nerve also that by its inhibitory power over the heart causes the pulse to intermit or drop beats with a most unpleasant sensation, quite alarming to impressionable individuals.

Another nerve that influences the action of the heart is called its *accelerator nerve* because when it predominates over the steady going pneumogastric it sets the heart to beating with often great rapidity. It is the influence of this accelerator nerve that gives the timid youth, for example, his

unpleasant thumping of his heart and pounding of the pulse in his ears or head when he rises to deliver his first speech before an audience, or when he rings the bell at the door of his best girl's house. Such a palpitation, as it is called, is, of course, transient and without injurious effect, but in some cases of heart disease or of other affections a rapid pulse may persist for a long time with, as we shall see, harmful results to the heart.

Finally before concluding this sketchy description of the anatomy of the heart and blood vessels, it should be said that as the body in general is supplied with arteries, capillaries and veins (the systemic or general circulation) so are the lungs furnished with three sets of vessels. But, unlike those derived from the aorta and delivering arterialised blood, the pulmonary or lung artery takes its origin from the right ventricle (see Figure No. 2 and frontispiece) and carries impure venous blood to the air cells of the lungs for oxygenation and purification. Then from here the now purified red blood is sent to the left auricle, whence, as will be described presently, it passes into the left ventricle and aorta. Thus the pulmonary artery and its branches transport dark venous blood, while the pulmonary veins bring red blood back from the air cells to the left side of the heart. In this respect the greater or sys-

temic and the lesser or pulmonary circulations differ though both perform the same function.

There is yet another system of vessels that must be briefly described if you are to get a clear understanding of factors that influence the health as well as the diseases of the human body. These are the *lymphatics or absorbents*, the function of which is to absorb and convey to the blood stream not only the products of digestion, but also the products of waste, resulting from the wear of tissue. These vessels ramify throughout the body in more or less intimate relation to the veins and eventually pour their contents known as *lymph* into the great veins shortly before these latter empty their stream into the heart. They often play a decided rôle in the absorption of bacterial toxins or poisons and in childhood are especially abundant and active. As will be seen in later chapters, the lymphatic vessels and glands of the neck can take up bacterial toxins and even the germs themselves from diseased throats and discharge them into the blood stream by which they reach the heart and general circulation. Fortunately, as will be shown in describing the blood, nature has provided the body with certain forces that resist or destroy bacteria and their toxins when these do not enter the blood in such num-

bers as to overwhelm the resisting forces of the body.

These forces reside mainly in the white blood cells known as *leucocytes* or, to be quite correct, certain leucocytes to which has been given the name of *phagocytes* or devouring cells, whose duty is to act as policemen or guardians by at once attacking and devouring dangerous invaders. Then there are the red blood cells which carry oxygen to or carbonic acid from the tissues, while the serum or water of the blood serves as the medium wherein float white and red corpuscles alike, together with various salts and nutrient materials held in solution.

## CHAPTER III

### THE CIRCULATION AND ACTION OF THE HEART

NOW let us see how the flow of blood is accomplished. First it must be remembered that nature abhors a vacuum and hence no part of the circulatory system is ever empty. But the heart and vessels are completely filled, indeed, slightly over-filled so that the vessels are in a state of slight tension, arterial tension, as it is termed. In consequence of their elasticity and contractility the arteries are found empty after death, having forced their contents into the unresisting veins. What is it, therefore, that keeps this from happening during life? It is, as we all know, the rhythmic contraction and dilatation of the heart. But what makes the heart beat and go on beating? That's the question which even physiologists have not settled to the satisfaction of all. Without entering into the discussion, whether the heart contracts because of nerve stimulus or of a property residing in the heart muscle itself, it is sufficient to state that, owing to the presence of blood within the right auricle,

the stimulus to contraction starts in a certain collection of muscle fibres, called a *node*, in the part of the wall of this auricle known as the *sinus*, and this node is designated the "pacemaker for the heart." Thence the stimulus to contraction passes rapidly into other portions of the heart, so that the two auricles beat in unison and a fraction of a second earlier than do the ventricles, and the alternate contraction and relaxation of the heart, having begun before birth, is kept up so long as life lasts. It is, therefore, the presence of blood within the heart that keeps it contracting, for if a solution of ordinary salt be made to flow through a frog's heart previously inert because removed from the animal's body, the heart at once resumes its beating. But whether the orderly contraction and relaxation of the organ be the result of nerve stimulus or of some property residing in the heart muscle independent of its nervous supply need not concern you. For you it is sufficient to know that a healthy state of the heart wall is necessary to its perfect action and that weakening of the muscle from degeneration or inflammation is a serious matter.

To understand the working of this human pump we may picture to ourselves the stream of blood pouring from the great veins into the right auricle and so start from this point, although, as



a matter of fact, blood enters both sides of the heart at the same time and passes through it in identically the same manner. But to simplify the description we will start with the right auricle.

This chamber receives blood brought to it by the superior and inferior vena cava previously mentioned, and as the great vein formed by the union of these two joins the wall of the auricle without the intervention of valves, the chamber in question becomes quickly filled. So soon as this has been accomplished the muscle of the auricle contracts and, forcing open the tricuspid valve, pours its contents into the relaxed cavity of the right ventricle. Next this chamber becoming entirely filled undergoes energetic contraction in its turn, which closes the three flaps of the tricuspid valve and at the same time forces open the valve leading into the pulmonary artery, thus expelling its contents with sufficient impetus to distend the already filled artery. The impact aided by the elastic recoil of the vessel sends the blood onward through the entire system of capillaries and veins to the left auricle. This chamber now fills and when it can hold no more contracts and discharges its volume of blood through the mitral orifice into the left ventricle, completely filling it. Thereupon the muscle of this portion of the heart undergoes contraction (systole)



and forcing shut the mitral valve sends its stream pouring through the aortic valves into the general arterial system. The coats of the aorta are very strong and elastic, so that, being already filled and receiving still more blood from the ventricle, the vessel reacts by a contraction which would drive blood back into the ventricle, did not the aortic valves close promptly. This bufferlike action of these valves, precisely corresponding to what takes place in the pulmonary artery through sudden closure of its valves, drives the column of blood onward, its progress being all the while facilitated by the elastic recoil of the coats of the several arteries until at length the capillaries and veins are reached. Here the flow becomes slower partly on account of its distance, so to speak, from the propelling power of the pump, but partly because in many of the veins, those in the arms and legs for instance, the blood has to flow against the force of gravity. Consequently three other factors now come into play to aid the heart and arteries in their task of maintaining adequate, continuous circulation.

Two of these factors are (1) the aspirating or suction effect of respiration and (2) muscular contraction. With each inspiration the great muscle known as the diaphragm, which divides the chest from the abdomen, flattens out and thus

encroaches upon the domain of the abdomen, squeezing its contents into a smaller space. But with the next ensuing expiration and consequent ascent of the diaphragm, pressure within the abdomen is lessened and the many veins bringing blood up from the parts below feel an accelerating impulse which sucks or aspirates their contents strongly toward the liver and through this to the inferior vena cava and other vessels, transporting blood to the right side of the heart. The effect of respiration upon the veins of the head and upper portions of the body is still more apparent. Take half a dozen deep breaths and you at once notice slight light-headedness and may even feel a trifle faint. If so, it is owing to the rapid, forcible emptying of the veins of the head.

The second factor aiding venous flow is the contraction of muscles as in walking. This is so because most veins either lie between groups of muscles or are so crossed by these that when muscles contract they squeeze the veins and would force the blood backward were it not for the valves previously mentioned as forming sort of cups within the veins. These cups check the blood just enough to give it a forward, not a backward, impulse, and so the flow is aided in the right direction. When you stand still for a long time and feel your feet and legs swell and

grow stiff, or when your hands hanging immovable at your sides turn red and the veins show as bluish cords, it is because the onward flow of blood becomes sluggish and lacks the propelling influence of the muscles.

The third factor in maintaining a steady, uniform flow of blood through the entire circuit of vessels, is the difference in pressure to which the blood is subjected in the arteries and veins. The aorta, by reason of the firmness of its coats, offers so much resistance to the outflow from the left ventricle that the blood here in the aorta is under what is known as positive pressure. On the other hand, so little obstacle is offered to the free discharge of blood into the right auricle from the two great veins, the inferior and superior vena cava, that in these vessels the stream of blood is under negative pressure. This difference in pressure, therefore, facilitates easy outflow from the entire venous side of the circulatory system.

But let some disease of the heart, as for instance, an extreme narrowing of the mitral valve or a very free mitral leak, retard the flow of blood through the lungs, then the right ventricle finds its work increased and undergoes more or less dilatation. This in turn interferes with easy emptying of the right auricle into the ventricle and this increased pressure in the auricle hinders free

emptying of the great veins into the auricle. Pressure within the veins is augmented and in extreme cases may nearly equal that in the arteries. The result is a slowing of the venous current and in bad cases such an over-filling of the veins and capillaries that some of the water or serum of the blood leaks out into the tissues, producing dropsy, or *œdema*, to use the medical term.

In milder cases no dropsy occurs but the liver becomes swollen and tender from congestion and a similar congestion being produced in the vessels of the kidneys, the function of these organs is hampered and the urine grows scanty and concentrated with or without albumin in the urine, depending on the degree of congestion.

From the description just given it is clear that perfect circulation requires a harmonious and well-balanced adjustment of all the factors concerned. The two sides of the heart must be able to receive and expel all the blood brought to it as rapidly as received, and the vessels must be in a healthy state to convey the blood as quickly as it is discharged into them. If the heart is not able for any reason to expand and contract normally and exercise is persisted in, the stream of blood will of necessity find a barrier to its onward rush in this very weakness of the pump. It becomes dammed back in the lungs just the same as is a

river when obstructed by a dam. The blood vessels of the lungs fill up and now and then actually overflow in the same manner as a stream overflows its banks. The result is in such a case that the individual feels choked, begins to cough and expectorates a thin frothy, slightly pinkish fluid and unless speedily relieved by treatment may actually drown in his own serum, for it is the water of the blood that is filling up his air tubes and threatening to asphyxiate him. This condition is known as *Acute Pulmonary Œdema* and occurs most often in persons with abnormally high blood pressure or with decided narrowing of the mitral valve.

As walking or running is the very kind of exercise that sends the venous blood pouring rapidly back to the heart, it is readily comprehensible why you should not hurry or, indeed, do much rapid walking if your heart for some reason can not handle easily the stream of blood pouring into it. It becomes intelligible also why absolute physical rest may be the one thing needed to spare your damaged heart from serious dilatation and your lungs from dangerous overfilling.

Finally, if the circulation is to be carried on smoothly and unconsciously to us, there must be an orderly, well-regulated action of our hearts. In perfect health of mind and body the cardiac



contractions are absolutely rhythmical and even, but not of the same rate at all times. If you are an adult your heart probably beats about seventy-two times a minute, but varies from this according to what you may be doing. It is from five to ten or twelve beats faster when you are standing than when you are lying down, is still more rapid when you are walking or running and is appreciably slower when you are asleep. Emotional states may increase or decrease the rate of the pulse and may even cause it to intermit through, as you know, the inhibiting action of the pneumogastric nerve. On the other hand, the heart may be readily quickened in its beating, and in some highly excitable persons this tendency becomes very noticeable. This *Tachycardia* or rapid action of the heart is often accompanied by flushing of the face and even perspiration. It then is very apt to frighten one and is the thing that convinces the person that there is something radically wrong with his heart. In nearly all instances this is not so and we doctors call the condition a "*Cardiac Neurosis or nervous heart.*"

A persistently rapid action of the heart may in time become serious since the only time this faithful organ gets for rest and repair is the interval between its contractions. This short period of rest is known as the *Diastole* and corre-

sponds to the brief fraction of a second when the four chambers are relaxed and being filled. Therefore, if you are, by reason of age or infirmity, in possession of a not robust heart do not rob it of its time for rest by being forever on the go in one way or another, for you are tending to wear it out.

As might be expected, the orderly action of this inimitable pump is very likely to be disturbed by disease of some of its parts. When inflamed its rate of contractions is generally much quickened and in this very rapidity may lurk danger of the muscle becoming over-fatigued and giving out. Valvular diseases are also very apt to derange in one way or another its orderly and harmonious action, generally by either causing Tachycardia or just the opposite, marked slowing known as *Bradycardia*. In some cases, too, when the heart muscle is much involved in the changes of inflammation or of fatty degeneration the organ becomes irregular both in the rate and strength of its contractions, a state of things which interferes with good circulation and good functioning of the other organs if it becomes habitual.

Transient irregularity as from dropping of beats is not of serious consequence even to defective hearts, but is a cause of much alarm to most persons and certainly occasions a very disagree-



able sensation. Nevertheless, such disorderly action on the part of your heart should not be allowed to go on without getting advice from your physician as to its cause and the means of correcting it. Above all things, do not permit yourself to get into a panic over it as so many persons do for one of the hardest tasks a doctor has to do oftentimes is to rid a person of the notion that his attacks of palpitation or intermittence mean a dangerous disease of his heart. Such a person is often possessed by the fear of dropping dead during his attacks, whereas such a catastrophe is the great exception and only likely when the heart is actually damaged seriously as shown by careful examination. Remember the attack of itself does not necessarily indicate disease.

## CHAPTER IV

### THE HEART SOUNDS—THE PULSE AND BLOOD PRESSURE—EXERCISE AND THE HEART

**D** ID you ever listen to the sounds of the heart? If not, put your ear to the chest of some friend and you will hear two clear tones that have somewhat the rhythm of the slow ticking of a large clock. They are known as the first and second sound and of these the first is normally the louder and lower pitched. It is heard just as the heart strikes against the wall of the chest and is produced by the closure of the mitral and tricuspid valves and by the contraction or systole of the two ventricles. The second sound of the heart is believed due to the snap of the pulmonary and aortic valves as they close immediately after the ventricles have expelled their contents into the arteries, from which the valves are named.

The brief pause or interval of silence between the first and second sound corresponds to the fraction of a second of time it takes for the ventricles to empty themselves. Following the second sound occurs a somewhat longer period of silence

and this agrees with the time required for the filling of the ventricles. This is known as the diastole and is in reality the period that is allowed for the heart to rest, and as the ordinary rate of the heart's contractions is about seventy-two beats in a minute, it becomes plain that habitual overwork must rob this faithful pump of much of its needed repose.

Physicians have to familiarise themselves with the characters of normal heart sounds for they become changed by disease of the valves or of the heart muscle and may and do often become replaced by other sounds termed heart murmurs. These murmurs vary greatly in quality, pitch, loudness and location or place where they are heard most distinctly. Some of them occur during systole and some during diastole and in some instances may be so loud as to be audible all over the chest, back as well as front, and even at a short distance from the body of the patient. Occasionally a heart murmur may have a musical quality, whistling, scraping, sawing, etc., and such hearts are spoken of as Musical Hearts. As a general thing heart tones and heart murmurs are not audible to the individual unless the heart be beating violently, when one may perceive its pulsation in the ears. A lady was so accustomed to this sound in her ears, even when the heart

was beating quietly, that she would grow worried so soon as she no longer heard her heart beat and would send for her doctor to be reassured that the pump was not giving out.

**THE PULSE.** The preceding leads naturally to a consideration of the pulse. You are probably familiar with it, having felt of it either on your own wrist or that of some one else. It is customary for the doctor to feel the pulse at the wrist and persons sometimes inquire if he wants the right or left hand, thinking that the left wrist may have a stronger pulse because on the same side of the body as is the heart. Very exceptionally one radial or wrist artery is smaller or runs in a different direction than the other, but in general it makes no difference which wrist pulse is studied.

If you feel your pulse you will notice that it comes regularly and evenly and that between its beats you can feel nothing. This would seem to contradict the statement previously made that because of the elastic resistance of the vessels the blood flows continuously and not in spurts. As a matter of fact blood is flowing along past your finger when you can not feel the pulse, and the reason you feel the pulse wave or beat is because of the systole or contraction of the heart. That is, each time the left ventricle throws its

contents into the aorta the mass of blood already in this great vessel and its many branches gets an impulse or jog forward in the direction of least resistance. This impulse or thrust, as it were from behind, distends the arteries and this sudden widening of the artery you are feeling is perceived as a pulse wave or beat.

It makes no real difference in what artery the pulse is noticed, and the only reason the radial or wrist artery is felt of is its easy accessibility and the resistance offered by the bone as a back-ground. In excitable or impressionable persons the pulse will often become much more rapid and even irregular so soon as the doctor begins to count and study the pulse at the wrist. On this account the doctor sometimes feels the pulsation of the artery on the temple or in the neck when the attention of the nervous patient is otherwise occupied.

You do not need to know all the changes the pulse may exhibit to an experienced physician. It is sufficient here to state that the doctor takes notice of its rate, strength, or volume and its regularity or irregularity as well as the state of the arterial coats.

**BLOOD PRESSURE.** If you were to feel the pulse of a number of people of different ages, you would notice probably that in some persons it

would be soft and easily compressed, while in others, especially individuals of middle age or over, the pulse would give the impression of resistance. This difference is due to diversity in tension or what is called blood pressure. So much is said by physicians concerning blood pressure and the laity knows so little about it, except to be alarmed whenever told their pressure is high, that it will interest you, no doubt, to learn something in regard to it.

Blood pressure does not mean only the pressure of the blood on the coats of the arteries but also the pressure exerted on the blood in consequence of causes not yet fully and convincingly ascertained. Increased blood pressure, or, to use a better term, increased arterial tension, attends and is a result of most cases of Bright's Disease, and is found in nearly all persons with hardening of the arteries. But there are instances of abnormally high blood pressure in which neither the kidney nor the arteries seem sufficiently diseased to explain it. It appears likely, therefore, that the real cause of high arterial tension lies in excessive action of certain bodies or so-called Ductless Glands lying in contact with the kidneys and known as the Adrenal Glands. Just why these glands raise blood pressure in some persons and not in others is not always clear, but by some



physicians they are thought to do so because of some focus or source of chronic infection, as, for instance, possibly disease of the gall bladder. However this may be, you do not need to concern yourself with the underlying cause. It is enough for you to know how we doctors estimate the arterial tension and what is considered normal.

Until within rather recent years physicians used to estimate the tension of the pulse by noting how it resisted pressure by the finger, and they spoke of the pulse as soft or hard and tense. This is not a reliable method for stiffness of the vessel coats may give a false sense of pressure, when as a matter of fact the blood pressure is found not to be high. Consequently, an instrument is now used known as a Sphygmomanometer, which signifies merely a measurer of the pressure of the pulse. It consists of a rubber cuff or band to be strapped around the arm above the elbow and connected by means of a rubber tube with both a rubber bulb and a glass tube containing mercury. Sometimes a metal box having a metal lever is employed instead of a column of mercury. So soon as the cuff is firmly but not too tightly adjusted to the arm, the doctor begins to inflate the band by means of the rubber bulb until the arm is so tightly squeezed as to obliterate the pulse at the wrist. It is found on watching the mercury



column that as the cuff is distended the pressure of air in the rubber tube is also raising the mercury. Then when the pulse can no longer be felt at the wrist, air is gradually allowed to escape from the cuff, the examiner observing all the time the descent of the mercury column. He does this until either his finger at the wrist perceives the first faint flicker of the returning pulse or still better until by means of an instrument (Stethoscope) he hears the first sharp snap of the artery below the elbow as the returning blood wave distends it. The height of the mercury shown by the scale determines the degree of maximum or systolic pressure. The mercury is now permitted to fall still more until a certain other point is reached which registers the minimum or diastolic pressure.

By systolic or maximum pressure is meant that to which the arteries are subjected at the instant the left ventricle expels its contents into the aorta. By diastolic or minimum pressure is meant that degree of pressure existing in the arteries between the beats or systoles of the heart.

Now you must remember that blood pressure varies at different ages and under various conditions as the rate of the heart's action, the time it is recorded, as whether before or after a meal, the mental state of the individual, etc. It is diffi-

cult, therefore, to state just what may be your blood pressure when you are reading this or when you are being examined by a physician. Medical authorities state that normal blood pressure varies within rather wide limits according to circumstances. It is given as ranging from 100 millimetres of mercury to 140 for the systolic and somewhere from 60 to 80 millimetres for the diastolic. Figures above 150 or 160 millimetres are considered as high and when the maximum or systolic pressure is above 180 it is becoming serious, and yet persons are seen who endure apparently without discomfort pressures of 200 and even 220 with a diastolic pressure of 100 or even 120.

Nevertheless, you should understand that such abnormal pressures, even though not causing conscious symptoms, are dangerous. In such cases the heart and arteries have to bear abnormal strain and careful examination will usually reveal enlargement of the heart, more or less disease of the kidneys and stiffness of the blood vessels. In time persons with very high arterial tension are bound to suffer the consequences in way of uncomfortable dizziness, heart weakness, breathlessness and congestions, or not infrequently are laid low by a stroke of apoplexy due to rupture of a small artery within the brain.

Inasmuch as increased arterial tension indicates changes of a diseased nature it is rarely possible to lower the pressure to normal figures. Something, however, can be accomplished by treatment either toward its reduction or toward the prevention of it becoming higher. To this end persons with high blood pressure or who suspect that they may be developing it, will do well to seek medical advice. Some directions along this line will be found in subsequent pages.

**EXERCISE AND THE HEART.** Perhaps no question is more often asked by the laity than this: "How much exercise can I stand without overstraining my heart?" As a matter of fact, it is probable that the perfectly healthy heart will stand as much exercise as the individual is inclined to give it, for before the heart becomes overstrained the person experiences so much discomfort of one kind and another that he desists from his strenuous physical effort.

In other words, if the heart becomes really injured by violent exercise it is likely that the heart is not perfectly sound but has suffered some defect produced by previous illness, although too slight to be detected by ordinary means of examination.

But you may exclaim, "Do not athletes, as college oarsmen or football players, sometimes suffer from an over-strained heart?" Certainly they do!

and often these fellows are the picture of robust health! Nevertheless, these young giants have generally gone through some illness in childhood that has left its scar on the heart muscle or they may have undermined its nutrition by excesses of one kind or another that if fully known would account for their inability to stand the strain on their hearts.

In consequence of very severe and prolonged physical exertion, as a twenty-five mile Marathon race or a rowing contest, for example, even a healthy heart may exhibit temporary effects of strain in way of dilatation and murmurs, but the organ recovers its tone after a period of rest and eventually is none the worse. Runners speak of getting their second wind, which is no doubt evidence of the heart accommodating itself to the strain put upon it, and for the most part men indulging in long runs do not suffer any ill after effects.

Oarsmen in particular are believed to develop hypertrophy of the heart, that is, increased thickness of its wall, and the same is said of mountain climbers. If so, it is merely a manifestation of what is seen in the arm muscles of the blacksmith and is quite physiological. But so long as the heart is perfectly sound, exercise does not do it harm. This is especially true of the young.

It may be quite a different thing, however, at or beyond middle age, when the blood vessels are no longer elastic as in youth and when the state of the heart muscle is uncertain. Exercise does two things: it raises blood pressure and quickens the action of the heart. It is easily understandable that under some circumstances, unusual and prolonged exertion may do great and permanent harm. Hardening of the arteries occasions abnormal resistance to the outflow of blood from the left ventricle, and with its action increased to perhaps twice its normal rate, the heart can not expel its contents as rapidly as the muscular effort and quickened breathing accelerate the flow of venous blood to the heart. So that these conditions may and often do bring about dilatation and other signs of serious heart strain.

Indeed, instances are not unknown of this kind in men who have engaged in arduous mountain climbing to which they were not accustomed and for which their heart and arteries were not fit.

For persons who have valvular heart disease or who have passed through one or more illnesses capable of inflicting injury on their heart muscle the caution is expressed: Do not engage in athletics without a careful physical examination by your family doctor in order to ascertain whether or not exercise is prudent. Furthermore, even



with a heart somewhat damaged certain forms of not too strenuous exercise may be permissible and these your physician can and should designate. They will be mentioned also in later pages of this little book.

You may not have any form of cardiac disease so far as you know, but you may be very fleshy and perhaps nearing middle age. If so, strenuous exercise may have its perils of which you should be made aware. For you it is not prudent to sprint for a train, to play tennis or hurry along the streets if you find such efforts put you uncomfortably out of breath. The very weight of your ponderous body and the necessity of pumping blood through it, particularly against the pressure on your abdominal vessels caused by the load of fat surrounding them, demand at all times an amount of work much in excess of that required in a thinner person. Furthermore, it is possible that your heart is actually weighted down by an overgrowth of fat on its surface (see next chapter) and on this account be labouring under difficulties. Therefore, do not engage in occasional and unwonted exercise that takes your wind, but if you are ambitious to compete with persons of lighter weight, put yourself in training of the sort that will harden your heart muscle and reduce your weight.



## CHAPTER V

### WHAT DO WE UNDERSTAND BY HEART DISEASE?

IT is customary among physicians to divide disorders of the heart into two main classes, according to whether the organ is damaged in structure, or is only disturbed in action without discoverable change in size or sounds on careful medical examination. When the action of the heart is only disturbed, as by a too rapid or an irregular beating, it is spoken of as a functional disorder and can generally be corrected by skillful treatment. When on the contrary the physician detects something wrong in the heart sounds or in its size and shape, that is, an enlargement, the condition is termed an organic disease or affection of the heart. Now this word organic is usually very terrifying to people, but please remember that, although the human heart may have some defect, this may not of necessity be so serious as to threaten life or even materially affect the health. Just as an automobile may have a loose joint or may rattle disagreeably because of

hard usage and yet may be serviceable for a considerable time longer, provided it is driven carefully, so the heart, even if not perfectly sound, may go on working satisfactorily for years provided it is not abused or damaged still more. As a matter of fact, the heart is so marvellous an organ that it will stand an immense amount of hard usage and even abuse often for years before it rebels, and yet it is not wise to presume on its good nature, so to speak.

And now that you may understand what is meant by, or rather what are the forms of organic heart disease, a brief account of them will be given. In a general way they are divided into defects caused by inflammation and those due to degeneration, this latter being in most cases the result or manifestation of a slow and insidious change or decay, as it were, like that characterising old age in other organs and tissues. Thus there is a fatty degeneration and a fibroid degeneration of the heart muscle, for they affect the muscle or wall rather than the valves, although in some old persons these may become more or less stiffened and chalky, a condition that used to be called Ossification of the heart. In Fatty Degeneration the muscle grows soft and less able to contract strongly in consequence of the muscle fibres becoming infiltrated or filled, so to speak,

with drops of oil or fat. In very extreme instances such a heart may be so soft that on examination of it after death a finger can be easily thrust through it.

In Fibroid or fibrouslike degeneration the muscle fibres lose their contractility more or less because they become hard and leathery. This change is not uniform throughout the heart walls but is more or less scattered in patches and is often mixed with areas of fatty degeneration. In such hearts, moreover, the walls are usually thicker than normal although they may have stretched and led to dilatation of the cavities. In either form of degeneration, commonly known among physicians as Myocarditis, the heart is weakened often to such an extent as to be unable to perform its work and death ensues.

Degeneration of this vital organ generally attends advanced age but now and then is found in comparatively young and apparently robust individuals as a result of acute illness as typhoid fever, pneumonia, influenza, diphtheria, etc.

When observed in old persons or those getting on past middle age this change or myocarditis is usually associated with similar alteration in the coats of the blood vessels. The arteries are then spoken of as hardened. This condition, termed **ARTERIO-SCLEROSIS** by doctors, causes the vessel

to feel hard and stiff like a cord or even like a wire and not infrequently the artery may become curved or tortuous and may even have tiny collections of lime salts so thickly scattered along its coats as to make it feel like a lot of small beads strung on a wire. Of course, such cases are extreme and ordinarily are found only in persons of advanced age. Yet pronounced as this alteration is, it is quite possible for the individual to live into the eighties in comparative health and activity, provided, of course, the heart also has not suffered too great change.

The statement just made applies particularly to hardening of the arteries of the arms and legs. It is quite another matter when this change affects chiefly the Coronary or nutrient arteries of the heart or the aorta and its main branches. Disease of the heart arteries is most serious because, being narrowed as well as stiffened, they can not furnish enough blood to the heart muscle to keep it well nourished. The organ then undergoes fatty degeneration. If the aorta and its large offshoots are the main seat of the sclerosis they lose much of their elasticity and this rigidity so increases the work of the heart that its muscle or wall has to grow thicker and stronger (hypertrophied that is) just as does the arm of the blacksmith from the daily wielding of a heavy hammer. Then

when in time its limit of strength has been reached it is likely to dilate and at length give out entirely.

In some persons the arteries of the brain or of the abdominal organs suffer most from hardening or sclerosis, while the heart and great vessels within the chest escape much change. The symptoms then experienced concern chiefly the mental or digestive powers, as the case may be, and will be mentioned incidentally in future pages. This hardening of the large arteries within the chest and abdomen is generally associated with and possibly may be the cause in some cases of abnormally high blood pressure.

**DISEASES OF THE HEART VALVES.** These for the most part constitute the forms of heart disease caused by inflammation or endocarditis, although, as you shall see, pericarditis or inflammation of the bag enclosing the heart and myocarditis or inflammation of the muscle does also occur, usually in connection with endocarditis.

When inflammation of the lining of the heart takes place it affects the valves mainly and of these usually the ones situated in the left side of the organ, that is, the mitral and aortic. Why those in the right half of the heart generally escape is not known, but, nevertheless, the germs causing the endocarditis, entering the arterial



blood and being carried by it to the left auricle and ventricle, there lodge and multiply.

A minute description of the changes produced by endocarditis would be out of place here and so you must be content with merely a general statement of the effects.

**MITRAL REGURGITATION** is the term usually applied to such changes of the mitral valve as lead to a leak of the blood through it into the left auricle with every contraction of the ventricle. Such a leakage may be slight in consequence of but little damage to the valve-leafflets or these may be so nearly destroyed that they stand stiffly and widely open, presenting no barrier at all to the flow back into the auricle. Very often, too, this inability of the valve to close the opening is intensified by stretching of the ventricular wall in consequence of associated myocarditis or inflammation of the muscle which by its contraction squeezes shut the orifice as the valve closes.

Although **ACUTE ENDOCARDITIS** in the course of rheumatic fever is usually responsible for this form of valvular disease, it does not produce marked destruction of the valve suddenly. The doctor may detect the murmur denoting endocarditis soon after the onset of the rheumatism, but the cusps become greatly damaged more or less gradually. In fact, the injury proceeds often for



weeks after all acute symptoms of rheumatism have subsided. Then also as time goes on and the inflammation grows less the valve-leaflets tend to contract or draw together somewhat and thus interfere more or less with easy flow out of the auricle into the ventricle.

STENOSIS is the medical term given to obstruction or narrowing of an opening by a drawing together and even by adhesion of the cusps composing the valve and so there may be both stenosis and regurgitation at the same orifice.

MITRAL STENOSIS is the name applied to such a gluing together of the parts of the valve that they neither close nor open with the alternate contraction and relaxation of the ventricle but project like a cone or funnel into the cavity of the ventricle, leaving only a small opening at its point. In some instances this opening is so contracted as to resemble a button-hole and the condition is spoken of as the *Button-hole mitral* (see Figure No. 3).

Mitral stenosis is not produced speedily in the course of acute endocarditis as is mitral regurgitation, but develops gradually and, therefore, may not be discovered until years after it has begun. Another reason why it is often unrecognised is that the person (more often a female than a male) rarely admits having had inflam-



*Figure 3*—INTERIOR OF LEFT VENTRICLE, SHOWING BUT-  
TON-HOLE MITRAL SLIT.



matory rheumatism. Whereas in the case of mitral regurgitation there is usually such a history.

**AORTIC REGURGITATION** is, as the name indicates, a leak of the aortic valve. It is produced in the same manner as is the kind of leakage just described, but there is this great difference: Leakage of the mitral valve permits a return of a part of the blood into the left auricle where, meeting with the stream pouring in from the lungs, it occasions a damming back or congestion within the pulmonary vessels. In aortic regurgitation the blood or a part of it leaks back into the left ventricle from which chamber it has just been ejected. Consequently, it brings about an enlargement of that portion of the heart made up partly of stretching and partly of increased thickness of its muscular wall. This enlargement is salutary or compensatory, as we say, and is a wise provision of nature, since the organ is thus enabled to do its work satisfactorily. Nevertheless, in both forms of regurgitation much depends on the freedom of the leak and on the reserve power of the heart muscle. All forms of valvular defect may be with or without symptoms on the part of the individual, so long as the heart muscle withstands and counteracts the

impediment to the circulation caused by the valve defect.

AORTIC STENOSIS is the counterpart at the aortic opening of the condition found in mitral stenosis. It interferes, of course, with free passage of blood out of the ventricle into the arteries and when very pronounced is a very serious lesion. Fortunately, however, it is a relatively rare disease when existing alone and in an extreme degree. Not seldom, however, there is a combination of both obstruction and leakage, the same as at the mitral orifice. When stenosis alone exists the left ventricle finds the expulsion of its contents so difficult that its wall becomes greatly thickened but without any dilatation or stretching, until its muscle suffers exhaustion or becomes damaged by degeneration. Then, of course, the circulation grows proportionately weak and serious symptoms develop.

PERICARDITIS is an inflammation of the sac enclosing the heart and usually occurs in conjunction with acute endocarditis or myocarditis. Its effect on the heart may or may not be important, depending on the extent and intensity of the inflammation. The direct result of the pericarditis is to cause a pouring out from the blood vessels into the interior of the sac of more or less of the watery constituent of the blood. This is

known as an exudate or effusion and may in some cases be so copious as to fill the bag to distention and thus oppress the heart by its weight and hinder its adequate action. In favourable cases this fluid undergoes absorption back into the vessels, leaving the surfaces of the pericardium no longer smooth and glistening, but more or less glued together by what are termed *pericardial adhesions*. Some degree of adhesion always results from pericarditis, but when it is not extensive, that is, only localised to a small portion of the sac, it may not affect the health or function of the heart.

ACUTE MYOCARDITIS, by which is meant an acute inflammation of the heart muscle, ordinarily is associated with endocarditis and pericarditis, as in the course of rheumatic fever, but it may occur alone. It is probable that few cases of pneumonia, influenza or typhoid fever fail to leave behind in the heart wall some traces of the ravages of the illness. Fortunately, these are usually so slight or so circumscribed that serious weakness of the heart does not manifest itself. Nevertheless, changes in the myocardium may be thus started which years subsequently show themselves as fatty or fibroid degeneration. Therefore, although a person convalescing from some severe febrile disorder may not experience symptoms of

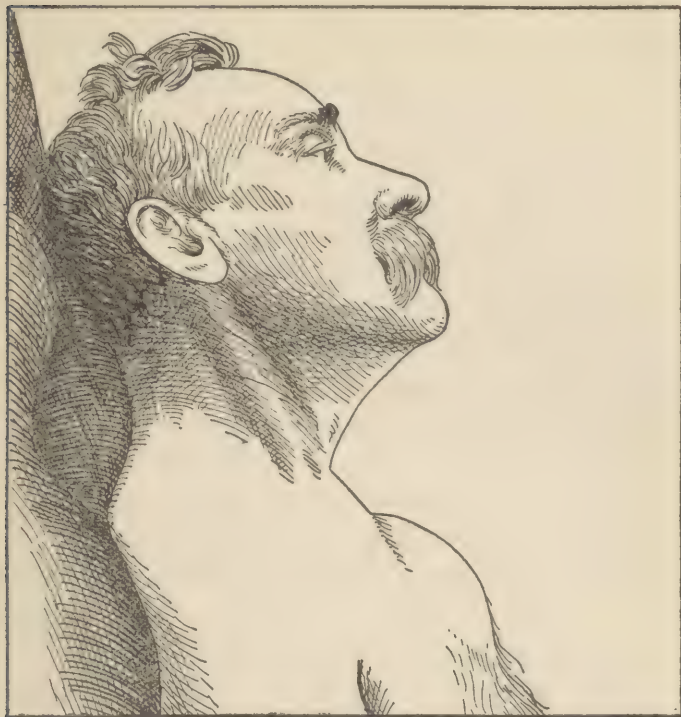


heart weakness, he should avoid overtaxing his heart lest he be disagreeably reminded that his pump has lost some of its driving force.

*Diphtheria* is especially apt to occasion severe damage to the muscle of the heart even though the disease appears to be conquered by the timely use of antitoxin. More than one child believed safely past all danger has died suddenly from heart failure while playing about.

This chapter would not be complete without a brief mention of two other forms of organic disease of this vital organ. One is what is termed ANEURISM. This is a pouching or circumscribed dilatation of some part of the wall of the heart or of a blood vessel. In the wall of the heart it can rarely be recognised during life, but in an artery and especially in the aorta near the heart it generally can be and is detected by the physician. It is a most serious matter in all situations, but when it causes marked bulging of the aorta (see Figure No. 4), distressing symptoms occur from pressure on neighbouring parts.

Whenever an aneurism develops the cause lies in localised degeneration which so weakens the part that it can not withstand the pressure of the blood and so stretches. Fortunately it is a comparatively infrequent disease and young people



*Figure 4*—EXTERNAL APPEARANCE OF LARGE ANEURYSM OF ASCENDING AORTA.



practically never suffer from it, unless having had syphilis.

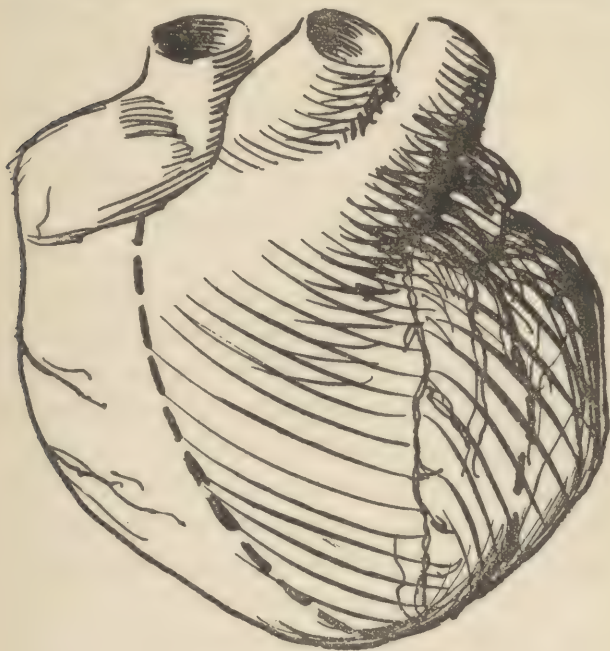
The last form of heart disease we need to consider in a book of this kind is that known as CONGENITAL HEART AFFECTION. That is, now and then, perhaps once in several million births, a child is born with some more or less serious defect in the makeup of the heart. Sometimes this congenital abnormality is of such a nature that it is not incompatible with life and the infant may grow to full maturity and even to middle age. In other cases the defect in structure is so great that the child survives only a few days, months or years. The precise nature of the defect can not always be determined during life, and in every case nothing can be done to remedy or correct the malformation.

From the foregoing it is plain that under the general term of heart disease is embraced quite a variety of conditions. Some are most serious, even dangerous, while others are of minor consequence and still others come really under the head of functional rather than organic disorders. But whatever be the real nature of the disorder from which you perchance may be suffering or which you may fancy you have, do not worry over it. Worry will only make your condition worse. Seek a physician and learn the truth, and should you

find you have a real disease of the heart or blood vessels, take it as calmly as you can and determine so to order your life as to get the most out of it in a sensible way.

Physicians sometimes tell their patients they have a *fatty heart* or *fat about the heart*. These terms are not meant to convey the idea that the heart is actually fatty, but that the outer surface of the organ is covered by a thicker layer of fat than is normally found on postmortem examination. There is usually a small collection of fat between the pericardium and the heart muscle, but now and then in very corpulent individuals and in heavy beer toppers the heart is discovered actually overlaid by a thick cushion of fat. In such cases also there is apt to be some fatty degeneration of the muscle fibres of the heart.

Nevertheless, when very obese persons develop cardiac weakness this is not owing necessarily to the condition just described but to dilatation from over-strain, the over-strain having gradually resulted from the very weight and activity of the individual. Fleishy people often pride themselves on their ability to run and hurry upstairs or engage in other athletic sports the same as do their companions of far lighter weight. Then, too, it is said that in very stout people the actual area of blood vessels is much increased, which of itself



*Figure 5*—SHOWING COMBINED HYPERTROPHY AND DILATATION OF BOTH VENTRICLES, THE DOTTED LINES INDICATING THE HEART AS IT WOULD BE NORMALLY.





obliges the pump to do more work. These two factors explain why, as pointed out in the preceding chapter, very corpulent people should be careful not to over-exercise.

**HYPERTROPHY AND DILATATION** are terms you often hear applied to the heart. As you have learned already the former term indicates increased thickness of the muscular wall, while dilatation means stretching of the wall and hence enlargement of the cavity or cavities as the case may be. These two conditions may be combined (see Figure No. 5) or may exist alone. When not occasioned by a valve lesion hypertrophy results from the long continued necessity of overcoming unnatural resistance in the blood vessels. Therefore, it is seen commonly in persons with stiff arteries and high blood pressure. In its most typical form this thickening of the wall of the left ventricle is observed in those individuals who have chronic Bright's Disease.

If the hardening of the blood vessels affects markedly the coronary or heart arteries, there may be little or no hypertrophy, and for the simple reason that the narrowed and thickened coronaries could not supply the heart muscle with sufficient blood to enable it to grow in thickness and strength. But whether hypertrophy develops or not, dilatation is bound to supervene in time if

the work to which the organ is subjected outruns the capacity of the heart to endure it. It is then, as a rule, that the individual begins to notice symptoms that make him believe something is wrong and send him to a doctor.

If the physician detects no valvular disease he usually finds disease of the blood vessels or kidneys or both to account for the cardiac enlargement and failing heart power. Do not fancy this state of things belongs chiefly or exclusively to elderly or old people. Bright's Disease and hypertrophy of the heart are not so rare as we could wish in persons not far beyond forty years of age and occasionally even in children who have some inherited poison, as syphilis, or who have kidney disease due to a previous infection, as scarlet fever.

Lastly, the right side of the heart may suffer any of the changes in size found in the left half, and when so, it is a result of some long-standing disease of the lungs that has put extra strain on the right ventricle, or this chamber may stretch in consequence of too severe and prolonged physical effort, as mountain climbing or carrying a very heavy load upstairs or for too great a distance.

## CHAPTER VI

### INFECTIONS

**I**N order that you may understand what will be said in a subsequent chapter on the cause of valvular disease of the heart, it seems best to tell in simple language what physicians now know in regard to infections, as diseases due to the action or germs are called. Forty years ago or so very little was known definitely concerning the cause of fevers and inflammations. That was because the science of bacteriology had not been developed to its present state of accuracy. Indeed, so little was known about germs that surgeons did not understand why wounds sometimes healed without the formation of pus or matter, or why this pus was sometimes of a foul odor and sometimes without any bad smell at all. They knew that if a cut or wound had no discharge of matter it would heal quickly, leaving no scar. They termed this sort of cure "healing by first intention." Thick sweet-smelling pus was called "laudable pus" because the injury showing this sort of pus tended to heal without much difficulty,

whereas when the matter was thin and smelt bad the wound would not heal and the patient was very ill and often died of blood poisoning.

Physicians appreciated that certain diseases, as diphtheria, scarlet fever, measles and erysipelas, were contagious, but they could only guess at the reason. Malaria was thought due to some miasm or invisible influence coming from damp swampy earth.

Then in rapid succession came the discovery of the tubercle bacillus as the cause of consumption, the pneumococcus as the cause of pneumonia, and the germ theory of disease was established and bacteriology became a science of fascinating possibilities.

The real field of research for the worker in bacteriology is animal experimentation, and without it we should still be in the dark as regards the part played by germs in the causation of disease. Thanks to many tireless investigators, we now have the germ theory of disease. Their painstaking studies and experiments have proven not only that most of the ills to which man is liable are due to the invasion of our bodies by germs, but also that epidemics and other complaints are communicated by these invisible microorganisms. Hence they have come to be known as *infections*.

ACUTE INFECTIONS are those that manifest pronounced and active symptoms of which fever is a striking characteristic. For the most part they run a short and stormy course, as does diphtheria and the equally, nay, more dreaded pneumonia, for diphtheria can be conquered by the antitoxin, while for the latter science has as yet found no antidote. A *chronic infection*, on the other hand, is one that pursues a slow, often insidious career and yet for that very reason may prove the more baffling. An example of this latter is pulmonary tuberculosis.

Two other subdivisions are recognised: namely, *focal infections* and *general or systemic infections*. A focal may lead to a general infection and may even be overshadowed in its manifestations by those of the latter. A tonsilitis is an acute infection and at the same time a focal one, but in time, under several repetitions, may become converted into a chronic focal infection. So striking and urgent are the symptoms of acute tonsilitis that with its subsidence the sufferer may deem himself well and yet his health may be seriously influenced by the persistence of the chronic tonsillar infection.

Another *focus* or plague spot from which the system is contaminated through absorption of bacterial products is what is known as a *mouth*



*infection.* This term includes the disease of the gums familiar to nearly everybody as Pyorrhœa Alveolaris and a still worse condition because often unsuspected: namely, a chronic abscess or collection of pus around the roots of the teeth. This apical tooth-root abscess may occur as one small pocket of pus or it may involve several teeth and it may exist alone or in combination with pyorrhœa. These mouth infections are often very serious affairs because by harboring the dangerous germs responsible for the disease, they favor absorption of the bacteria into the blood and their subsequent deposit in some distant organ or tissue.

One lady suffered from such a painful stiffness and lameness of certain muscles as to be unable to turn in bed or sit up without assistance. Her ultimate recovery followed the discovery and cure of some root abscesses. These had never produced local pain and were wholly unsuspected. Yet when one of her teeth was extracted and the abscess cavity scraped out by a dentist, the matter smelt so bad that the trained nurse was obliged to leave the room.

Still other foci or places of infection may exist in the appendix as a chronic appendicitis, in the gall bladder either with or without gall stones, in the bowel and various other parts. Any one

of the diseased parts mentioned may lead to chronic rheumatism, to sore and lame muscles and to incurable disease of the heart, blood vessels or kidneys.

And now you ask, perhaps, why is a focal infection so serious? Is it on account of its containing germs, and, if so, what kind of germs are they? The answer is simple. The danger lies in the fact established beyond all question that these places where chronic inflammation exists are the breeding grounds of innumerable bacteria and that the bacteria in question are precisely those that are most dangerous to us human beings and, indeed, to all of the higher animals.

These germs belong to that group of microbes known as the *Streptococcus*. This name is given to them because they are seen under the microscope as minute rounded bodies or beads which grow in chains. Innumerable and well nigh incredibly careful experiments and methods of culturing these micro-organisms have now proved that there are several subdivisions or strains of streptococci and that the different members of the same family possess distinctive characteristics both as to growth and to their ability to cause disease. One distinguished by its tendency to produce pus is called *Streptococcus Pyogenes* and it is this pesky little fellow that on entering a tonsil causes

*Quinsy Sore Throat* or getting into a cut on the finger or a prick with a needle perhaps causes the wound to form an abscess with formation of pus. Another close cousin is the germ causing inflammatory rheumatism and hence has been called *Streptococcus Rheumaticus*. This invader shows a special liking for the heart and heart valves and hence gives no end of trouble.

There is still a third member of this pestiferous tribe which it will be well for you to remember. This is the *Streptococcus Viridans*, so designated because of the fact that it produces a greenish ring in the fluid in which it is grown. It is found very commonly in chronically infected tonsils and in both forms of mouth infections already mentioned. When injected into animals or when it has gained access to the organs or tissues of man, this germ does not give rise to abscesses or to inflammation of joints, but shows a marked affinity for muscles and for the heart valves, if these have been previously injured by the streptococcus of acute rheumatism. How extremely serious this tendency is will be shown in future pages.

The *Pneumococcus* or germ of pneumonia was for a long time supposed to be quite distinctive and wholly different from the bacteria just mentioned. Recent bacteriological investigations appear to prove a close kinship between it and the

several members of the streptococcus family. Although displaying a selective action for the lungs it yet in reality sets up a general poisoning of the whole system, producing, among other effects, inflammation of the heart muscle and even endocarditis.

The Influenza germ, the Diphtheria Bacillus and still others may invade the heart muscle and thereby occasion acute inflammation of the heart walls, which, if it does not cause speedy death, undoubtedly leads to subsequent degeneration of the heart.

*Scarlet fever* is another infection that sometimes has serious effects for the circulatory system, and right here let it be said *Scarlatina* is not as supposed by some persons only a mild form of this disease. It is the medical term for scarlet fever and may be mild or severe. The danger to the circulatory system is owing to the fact that it is not seldom followed by rheumatism and inflammation of the heart, for although the germ causing the fever has not been definitely identified, it is probably a close kin to if not actually a strain of streptococcus. Then, too, scarlatina is very apt to be followed by kidney trouble, and inflammation of the kidneys is very apt to exert a bad influence on the rest of the circulatory appa-

ratus by raising blood pressure and so leading to enlargement of the heart.

There is still one more infection which is thought to be a rheumatic complaint and which, whether so or not, certainly displays a remarkable predilection for attacking the heart valves. This is Chorea or St. Vitus' Dance, as it is popularly called. Many a child has yielded up its life to the hostile member of the bacterial kingdom causing Chorea, and even when death is not the consequence, a serious valvular defect is left behind as a reminder of the invisible marauder's visit.

With so many foes aiming at the heart, is it any wonder that literally millions of people are found with disease of their hearts! Nay rather! it is a wonder that any children escape this consequence of their childhood's diseases. And now it may well be asked what prevents all sufferers from these infections from developing heart trouble or why do some individuals contract a disease when another does not. Let us see if we can answer these queries.

If you will recall, it was stated with regard to the blood that among the white blood corpuscles there are certain ones that have the special duty of acting as policemen or guards by promptly swarming in large numbers to the spot where



a foreign substance, as a germ, enters the circulation and devouring it. Hence they are called Phagocytes from two Greek words meaning to eat and Cells. Furthermore, the blood possesses additional defensive forces known as phagocytes which act as protective agents; also there are generated bodies that antagonise the poisons generated by bacteria and thus aid in overcoming infections. Therefore, much depends on the healthy state of our vital fluid. If we are well and strong we may be able to resist the attacks of our invisible foes, whereas if the blood is thin, that is, if we are anaemic, it may be unable to mobilise its forces in sufficient strength to resist the attack of infective agents. Also much depends on the number and virulence of the invaders, for no matter how armed we may be against them it is possible for us to be completely overwhelmed. Finally, as will be shown in the next chapters, very much of one's ability to escape or resist the entrance of bacteria into the system depends on a healthy state of the throat. Why some persons who contract one of these infections escape damage of some of the heart structures, while others do not, is difficult if not impossible to state, but it may have to do with intensity of the blood poisoning (*bacteriemia*) in one case and not in another, or the explanation may be found



in the greater susceptibility of some individuals. This certainly appears to be the case with children, for it is well recognised that adults ill with inflammatory rheumatism, for instance, rarely show evidences of endocarditis as compared with the young. In another place it will be shown that the minute vessels supplying the valves with blood are relatively more capacious in children, and this probably favours the entrance of germs along with the blood easier in the early than in the later years of life.

From the foregoing incomplete and sketchy account of the rôle played by bacteria in setting up focal and general infections, it is apparent surely how important it is for human beings, and in particular for children, to be protected against contamination by disease-producing bacteria and that we all should co-operate with our Health Officers in carrying out sanitary laws and that we should do everything in our power to educate the ignorant regarding them.

## CHAPTER VII

### RHEUMATISM AND THE HEART

**F**EW persons probably know the real cause of valvular heart disease or why children in particular are so likely to suffer from this malady. They may know in a vague way that inflammatory rheumatism is very apt to produce disease of the heart (rheumatism of the heart, to use a popular expression), but they have no clear idea what causes rheumatism and what is still worse they do not dream that rheumatism in childhood often shows itself only as an inflammation of the heart. If they think about its cause at all they believe the rheumatism is the result of some acid in the blood or comes from improper diet or exposure in a damp, cold atmosphere. That inflammatory rheumatism, and therefore rheumatism of the heart, is a germ disease, the same as is pneumonia, typhoid fever and tuberculosis, is wholly unknown to them and they are equally in the dark as to how the germ gets into the body and heart.

Until comparatively recent times even physicians were ignorant of the real nature of rheu-

matic fever and therefore of rheumatic disease of the heart valves, or they regarded with scepticism the view that it was of bacterial origin. There were a few, however, who, adopting the germ theory of infections, began to search for the microbe and to look for the place where the germ got into the system. Physicians had known that patients with rheumatism of the joints often had tonsilitis or only red, sore throats, but they considered the throat condition only a manifestation or result of the rheumatism, not dreaming that the focus in the throat could be the starting place of the general and joint disturbance.

On the other hand there were a few advanced thinkers who traced a possible causative connection between the throat and the general disorder, and being for the most part ardent adherents of the new germ theory of disease and workers in the modern science of bacteriology, they began to apply laboratory methods to the solution of the problem: namely, the true nature of rheumatic fever and the reason why this affection was so given to causing heart disease. To these investigators it seemed reasonable to assume that the tonsilitis or the inflamed throat might be the source of the mischief by harbouring bacteria and thus favouring the absorption into the blood either

of bacteria or of poisons generated by the mischievous little fellows.

Accordingly these laboratory workers took smears, as they are called, from the throat, that is, they rubbed a wad of sterile cotton or gauze over the surface of the inflamed tonsil or throat and then wiped this infected substance over the surface of some fluid material contained in a test tube and of a kind suitable for the growth of bacteria when kept at a certain temperature in an oven. After a certain number of hours or days it was found that this culture medium became covered by a vast number of germs, and by careful study they were able to identify the kind of micro-organisms with which they were dealing.

This, however, was but the first step in the process of investigation. It was then necessary to find out what these germs would do when introduced into the body of an animal or of a human being. Of course it would not do to experiment on persons, and so rabbits, dogs and Guinea pigs were used. And right here let it be said in no uncertain terms, that those writers and legislators who oppose vivisection and animal experimentation on the ground of cruelty are, whether knowingly or not, advocating cruelty to man, for without animal experimentation we should still be as ignorant of the true nature of acute diseases as

were the doctors of the middle ages. We should have no diphtheria antitoxin, no antimeningitic serum, no antitetanus serum and literally thousands, perhaps millions, of children would be lying in their graves who now are living proofs of the beneficent results of the employment of the lower animals for the sake of the health and life of man.

To resume—in order to determine the harmfulness of the bacteria obtained in the manner just described, a vast number of the germs were injected in pure cultures into the veins of the animal selected so that they might be carried directly into the blood stream. Experimenting in this manner two English physicians announced some dozen or fifteen years ago that they had produced inflammation of the animal's joints and heart valves of a kind identical with what is found in persons who die of rheumatic heart disease.

The statements of these two investigators were not accepted as conclusive by many bacteriologists, especially in Germany. But in the last few years several laboratory workers in this country have verified the accuracy of the conclusion announced by the English experimenters and have even gone them one better. Not only have the Americans confirmed the bacterial nature of inflammatory rheumatism, but they have proven the

germ to be the very one announced by Drs. Poynton and Paine of London, and they have shown why it is so dangerous to the heart. This germ is the *Streptococcus Rheumaticus*, as stated in a previous chapter. Dr. E. C. Rosenow, formerly of Chicago, has grown this microbe from the fluid of inflamed joints and then, by injecting a great number of this streptococcus into rabbits and dogs, has caused inflammation of their joints and heart valves of precisely the same nature as that found in human beings who die of rheumatism of the heart. Furthermore, on studying the hearts of animals injected with the bacteria, bacteriologists have discovered growing on the valves and in the minute blood vessels supplying the valves, enormous numbers of the germs, thus proving the endocarditis to be of bacterial origin. The disease is therefore, as doctors say, an infective one and not due to an acid in the blood, to the kind of diet or to exposure in a damp, cold atmosphere. This last may have its influence but only, as we shall see, by inducing a sore throat or aggravating a focus of infection already existing in the throat.

Rheumatism of the joints and the attendant endocarditis having thus been proved to be an infection, it became necessary to establish beyond doubt the place whence the microbes gain access to the system. It would be tedious to recount the



methodical and even laborious work done by American and other investigators. It is only necessary to state that their researches have confirmed in every particular the conclusions arrived at by the English workers. In short, it has been clearly demonstrated that the streptococci inhabit the throat and especially inflamed tonsils, and from there are absorbed into the blood and thus reach the heart. The work done by Rosenow of this country and by many other bacteriologists is so accurate and scientific and is subjected to such criticism by other investigators that you may accept their statements without question and look upon valvular heart disease as one more of the diseases due to the action of germs. You must recognise also that an acute or chronic focus of infection in the throat is a perpetual source of danger especially to children.

Right here you may be prompted to ask why a sore throat or tonsilitis is particularly prone to set up inflammation of the heart in children. There are two reasons, and one is the greater susceptibility of the young, or, in other words, the lessened resistance of the little ones by reason of the fact that the lymphatics or absorbents, as you know from their previous description in Chapter II, are very abundant and active in early life. Consequently absorption of bacterial poisons and

even of the microbes is readily induced. You know how easy it is for a young child to get up a fever and how quickly a baby seemingly perfectly well in the morning may by afternoon give every evidence of being very ill. That is simply a proof of the ease and rapidity with which the poisons of an infective process pass into the general system.

A second reason why a streptococcus infection of the throat leads to heart disease in a child has been shown by Rosenow. In his experimental work on animals he discovered that when the heart valves were inflamed the minute blood vessels leading to the affected valve were simply packed full of the germs responsible for the mischief. Well, in children these tiny vessels furnishing blood to the endocardium are relatively much larger than in adults. Therefore, when bacteria enter the blood, especially from the throat, they are carried directly to the heart and so find their way into the vessels supplying the valves. Moreover these vessels are what are known as terminal vessels. That is, they have only an opening for entrance of blood but no outlet, their contents being absorbed as nutrient fluid to the tissues. When, therefore, bacteria enter and block these terminal vessels, the phagocytes or guardian policemen of the blood can not swarm into the tiny

vessels already filled by the germs, and these invaders, taking advantage of that fact, grow and multiply with great rapidity. They then produce what is known as *acute endocarditis*. Does the foregoing account not make it plain how serious is a sore throat or tonsilitis in a child?

But rheumatism of the heart is not limited to inflammation of its lining membrane. Generally the endocarditis is accompanied by pericarditis, while in some cases this inflammation of the heart bag occurs alone or is so intense in its effects as to overshadow and obscure the inflammation going on inside the heart. In fact it may be accepted as a rule that endocarditis and pericarditis are generally associated. When this combination is severe, and, of course, some cases of this sickness are worse than others, when, to repeat, the infection is especially intense, the heart muscle likewise is apt to be inflamed, a condition which you can readily comprehend is proportionately more dangerous. In fact, when a child with rheumatism of the heart succumbs to the disease, it is not usually a result of the endocarditis or pericarditis so much as it is because of the weakness and dilatation of the heart wall.

And now, before this subject of rheumatism of the heart in the young is dismissed, it must be stated and stated emphatically that in a young

child streptococcus rheumatism may, and often does, show itself only as an inflammation of the heart. The joints are comparatively rarely affected, or, if they are, the symptoms are not so pronounced as in grown people and are apt to be overlooked. Accordingly many a child with a streptococcus infected throat is not suspected of having rheumatism until the physician discovers a murmur or other signs of serious involvement of the heart. This is something every parent should know, and it should make everybody having the care of children realise that a sore throat is a most serious matter with a child.

Thus far we have been speaking of the streptococcus rheumaticus and its malign effect on the heart, especially in the young. But it is quite possible for this germ to cause endocarditis in later years of life, although far less often. In persons well on in age an infection of the throat is not uncommon, but the portion of the heart now most often affected is the muscle and not the valves. Indeed, it is not at all a rare experience for the physician to see a streptococcus sore throat in an adult followed by serious and even alarming weakness of the heart. There may be dilatation and even a murmur indicative of myocardial weakness, and the condition is generally diagnosed as *myocarditis*. With proper care and treatment

such an involvement of the heart may be recovered from, but in not a few instances the weakness of the heart persists for months and leads to changes in the muscle that impair, to a greater or less degree, the pumping efficiency of the organ.

And now, before this subject of inflammatory disease of the heart is finished, it is necessary to take up the action of two other strains of this family of germs so hostile to us humans. As you recall it was stated in the chapter on infections that there are two close cousins, so to speak, of the germ causing rheumatism: namely, the *streptococcus pyogenes* and the *streptococcus viridans*.

Either of these two streptococci may cause heart disease, but their action is somewhat different from that of rheumatism. The pus-producing streptococcus on infecting the tonsil occasions an abscess of the tonsil, known as *Quinsy sore throat*, and singularly enough this tonsilar abscess is only exceptionally followed by endocarditis. When it is, however, the endocarditis is most intense and associated with severe blood poisoning and often with abscesses in other parts of the body. These abscesses are due to the breaking off of inflammatory products from the valves, which, swept away in the blood stream and carrying with them countless numbers of the streptococci, finally lodge in some small vessel in the skin, liver, kidneys or



spleen, and there permit the germs to grow and produce foci of inflammation that then terminate in formation of pus. Consequently this kind of endocarditis is usually fatal.

It must not be supposed, however, that the streptococcus pyogenes gets into the system only, or even most frequently, from the throat. It may invade the blood from an infected wound on the hand or foot, when it is neglected. So common was such blood poisoning in ancient gladiators that it was called The Disease of Gladiators. And lastly, it should be stated that Childbed Fever is sometimes due to this pus-producing germ, and that many a young mother has died of it, and that before the infection runs its deadly course the heart usually gives evidence of having become involved.

The action of the third member of this group, the *STREPTOCOCCUS VIRIDANS*, is somewhat different yet. This germ is very apt to inhabit, or to become implanted, as it were, on chronically infected tonsils, as well as in the pus of pyorrhœa or of a tooth-root abscess, and thence to be absorbed into the blood. It does not occasion acute articular rheumatism and rarely causes very acute blood poisoning, but gives rise to areas of inflammation in muscular tissue, and hence in the heart muscle. Nevertheless under certain circumstances it does



produce a most dangerous, often fatal, form of endocarditis.

Many an individual with a chronic valvular disease, yet without symptoms of serious heart weakness, has died of the action of this streptococcus viridans and for the following reason: He has harboured in his throat chronically sick tonsils to which he paid but little heed. Then one day when in apparently good health he has developed a slight sore throat or a mild tonsilitis or a grippe attack, as he thought, and from that time forth has not been well. He has had slight fever, lost gradually in strength and weight, looked pale, noticed unwonted breathlessness on exertion and perhaps has had a slight, dry cough. On seeking medical aid at last, he has been found to have an old, though perfectly compensated, valvular trouble, and, a culture of his blood being made, he has been found to have streptococcus viridans growing in his blood.

There are innumerable such instances. One man of about thirty gave precisely the history just outlined, and because of his cough and loss of weight, was supposed to have beginning tuberculosis of the lungs. The detection of a mitral leak, however, gave a hint as to the real nature of the malady, and an examination of his blood yielded enormous numbers of streptococci. His

illness lasted about six months and, when the heart was examined after death, both the mitral and aortic valves were covered with soft masses of germs (vegetations, as they are termed). These bacterial growths were so soft that from time to time fragments were torn off and carried into the blood stream, thus causing the unusually high fever from which this young man suffered.

Another young man had a mild attack of tonsilitis in April and, as he supposed, recovered from it. But he did not regain strength, and nearly two months later was taken to a hospital with, as his friends thought, typhoid fever. When seen a suspicious heart murmur was detected, and when it was learned that the illness had really begun with tonsilitis, a diagnosis of streptococcus endocarditis was made. The blood examination substantiated the diagnosis and a hopeless prognosis was given. In spite of everything that could be done or money could procure, the disease went on from bad to worse. Death terminated the scene six months subsequently, and when the heart was examined after death all four sets of valves were extensively diseased. Almost innumerable examples of the malignancy of this form of endocarditis might be cited, but the two narrated will suffice to make you see how serious is the com-

bination of an old valvular disease and a focus of infection in the throat or elsewhere.

The danger in this combination lies in the fact that when a set of valves has once suffered damage it is no longer healthy but is a place of lessened resistance. Its blood supply and nutrition are impaired, and so when the streptococcus viridans enters the blood and is carried to this valve, it finds all the conditions requisite for its growth and rapid multiplication. From time to time vegetations made up of countless numbers of germs are swept away into the blood vessels and so set up a low grade of blood poisoning, but nevertheless one that is very persistent and generally fatal.

These small fragments that break off from the affected valve and lodge in distant blood vessels are known in medical parlance as *emboli* and *infarcts*, and vary much in size and number. Sometimes they are very tiny and lodging in the skin produce groups of minute reddish spots. Sometimes they plug an artery of considerable size and occasion certain symptoms, depending on location, as in kidney, liver or other organ. One young man seemed to be actually in a fair way to recover when he suddenly got a plug in an artery of the brain, became paralysed and a week later was dead from pneumonia, a not uncommon termination of severe paralysis. Thus you see how ter-

rible is this variety of streptococcus heart disease.

There is one more fact with which you should be impressed before this particular subject is dismissed, and that is, it is not only infected tonsils which are dangerous, especially to a person with valvular disease. An infection of the gums or of the tissue about the root of a tooth, a carbuncle, a neglected cut or prick on the hand, a chronic appendicitis, a chronic infection of the gall bladder and even chronic constipation may harbour streptococci, which, escaping from any one of these foci and lodging in the heart, are capable of setting up a fatal endocarditis or myocarditis. This danger should be impressed in particular on persons with damaged heart valves. Remember, "an ounce of prevention is worth a pound of cure."

And now in closing this chapter let it be added that, although the streptococcus of whatever strain is the enemy most likely to invade the heart, it is not the only enemy from which this organ and indeed other organs should be protected. The streptococcus of rheumatism is the most frequent invader, but many other micro-organisms do, under favouring conditions, produce disease of the heart. Those most likely to do so have been mentioned in the chapter on infections, and to this you are referred. The thing for you to bear in mind

## 108 Your Heart and How to Take Care of It

---

is that practically all forms of heart disease are due to infections. In children this is always the case. In adults such a connection can not invariably be traced, that is, a direct or close connection can not always be traced, and yet it is probable that infections of one kind or another are at the back of all forms of cardiac disease, as it will be attempted to show in a subsequent chapter.

## CHAPTER VIII

### WHAT CAN BE DONE TOWARD PREVENTING HEART DISEASE DUE TO INFECTION?

SINCE diseases caused by bacteria are such a menace to the heart the question arises spontaneously, Can anything really be done to protect this vital organ from injury? The query is a very natural one, and to it much thought has been given. In the present state of human knowledge and of modern social conditions we can accomplish only a limited amount toward this most desirable end. Yet enlightenment on the part of the Public is indispensable if anything at all is to be achieved. Therefore, although what will be said may disappoint you, the subject must be approached from three angles.

INDIVIDUAL PREVENTION. To accomplish anything along this line you must have it strongly and clearly impressed on your mind that inflammatory disease of the heart begins as a local infection and that in the overwhelming majority of instances this focus from which germs reach the heart valves is in the throat or mouth. It must be understood



also that most of the cases of endocarditis seen by physicians are in the young or in persons whose valvular heart disease dates back to childhood or to the early years of life. If this be true, then there must be a good reason for it and a part of this reason is found, as previously stated, in the great susceptibility of the young to streptococcus infection of the throat.

Not only are children more susceptible but they are exposed to greater risk of infection. There is widespread ignorance or indifference among parental and other guardians of the young, concerning the prevalence and communicability of throat infections. A child develops a sore throat or even a rheumatic tonsilitis and what happens! Unless the child is actually so sick as to show it plainly by fever, great lassitude, loss of appetite, complaint of pain, etc., the parent or teacher pays but little or no attention to it. The child coughs, to be sure, and perhaps has a running nose, but what of that? Does not every child do more or less of that? Yes! of course, and hence the boy or girl is allowed to go to school and to play with other children at home or elsewhere. The school-room or the playroom is poorly ventilated at the best and at home the windows are kept closed to protect the child from draughts. So the moisture from the infected throat is coughed or sneezed out

into the atmosphere, and carrying with it myriads of streptococci or other germs, is taken into the throats of companions. Or what is still worse, the children all handle the same toys, pencils or books or they drink from the same cup, and infected by the hands of the one with "only a cold" a direct source of contamination is furnished for playmates or schoolmates, brothers or sisters. Is the picture overdrawn?

Can you not recall countless such instances in your own experience or in that of your children? But this is not the whole story. The "only a cold" subsides and nothing is thought of the hoarseness that persists or of the succeeding coughs and colds in the head that recur from time to time through the Winter—or perhaps at last it dawns on the intelligence of the mother or father that the child does not look well or that he may have a chronic bronchial trouble. This is particularly the case if the child coughs a good deal at night and disturbs the sleep of the parents or other children. So at length the family doctor is consulted and he takes the temperature, listens to the lungs but perchance does not examine the throat or gives it only a hasty glance, declares there is bronchitis and prescribes a cough mixture.

Sometimes it happens that the physician perceives large, shiny tonsils that stick out almost

half way across the throat, or they are red and show whitish spots on their surface but are not enlarged. Then what? If he is a wide-awake doctor and believes that diseased tonsils are better out than in, he advises their removal. But does the mother or father act on the advice? Sometimes they do, but in other instances they take the advice of some friend opposed to an operation on the ground that the tonsils must be of some good use or Nature would not have placed them there. And so the child is allowed to go on carrying about in his throat a capital breeding-place for germs and the little one catches everything that is going, from sore throats to diphtheria, scarlet fever, measles, etc.

The late Dr. Walter Christopher, a celebrated specialist in children's diseases, once declared that, as he thought over the many little ones he had treated, he came to believe that practically every sickness he had seen in the children started in the throat. That is a bold statement, but it is amply confirmed by observation as regards diseases of the heart of a streptococcus, that is, rheumatic origin.

It is astounding how universal it is to discover evidence of past or present infection of the tonsils and throats in persons with valvular heart disease. And many, many times when the question was

asked, "Have you ever had tonsilitis?" the answer came back, "Oh! I have had sore throats but no trouble with my tonsils." Yet inspection of the throat shows how mistaken is the person. As an instance of this is the case of a boy of ten who came for examination with his mother and his uncle, who said he was doing special work in diseases of the nose and throat. The boy was brought for examination because his uncle had heard a heart murmur and wanted to know how serious it was. The mother and the doctor both declared the boy had never had tonsilitis. Yet when his throat was carefully inspected a pair of badly diseased tonsils came readily into view. On having these pointed out to the uncle the surprise of this Nose and Throat Specialist can be imagined. The condition of the throat made it perfectly plain that the heart murmur indicated an endocarditis.

But why multiply examples or why dwell longer on the importance of a healthy throat, to say nothing about teeth and gums, if one is to escape the danger of a streptococcus disease of his heart. What is the remedy for this widespread evil! So far as you can, protect your child and yourself against contamination by others with colds, sore throats or grippe attacks. Then if, in spite of isolation and if need be quarantining any

one in the family with a throat infection, your child does get a cold, have it attended to promptly by your physician and see to it that he examines the throat. If the child is found to have a pair of sick tonsils, get rid of them so soon as the active inflammation is over. A tonsilectomy skilfully done by an expert operator does not begin to be as serious or fraught with such possibilities for harm as is a neglected focus of infection in throat or tonsils. But see to it that the offending structures are totally and not partially removed. A piece of diseased tissue may be as bad and as fraught with future mischief as is a whole tonsil.

A certain lad suffered from a terribly intense endocarditis and pericarditis that nearly cost him his life. Upon his recovery his tonsils were removed or at least supposed to be removed. A small portion was left in, however, and for two or three years he kept having rheumatic pains and slight recurrences of fever. Finally the oft repeated injunction to have the fragment of tonsil taken out was heeded, and what was the result? The boy no longer complained of rheumatic pains and spells of weakness with fever, but became a hearty fellow able to attend school and even engage in some of the sports from which previously he had been barred. He still has his leak in his



heart, but his heart has been preserved from more serious mischief.

You ask, perhaps, "Are not the tonsils of any use and, if so, ought they to be removed?" Yes! they are of use *so long as they are healthy* and can serve the purpose for which they are intended: namely, as sort of filters or barriers against the absorption of germs inhabiting the throat and mouth. But when they have become transformed by repeated bacterial invasion into sacks of pus or masses of diseased tissue harbouring multitudes of hostile microbes, they are no longer guardians of the health but have become changed into enemies, into allies, so to speak, of the very poison spreaders they are supposed to repel. Under such conditions they do harm and should be gotten rid of. Their removal may not be an absolute guarantee against future throat infections, but they go a long way in this direction. No sane person would recommend the extirpation of healthy tonsils any more than he would advise the cutting off of a healthy hand. But when the hand is a mass of gangrene or has an incurable abscess in its tissues, it is better off than on, and so it is with diseased tonsils. You have heard probably of a tonsilectomy sometimes being followed by severe bleeding or acute blood poisoning or even death, but in every such case there was grave



fault somewhere. The operator was not skilful, or the operation was done at an improper time or obstacles were encountered that could not be foreseen. Such results do not prove the operation to have been unwarranted and should not be taken as an argument against the removal of the tonsils in every case. It only calls for skill, good judgment and the proper selection of the time for the tonsilectomy.

There is a second point of view from which we must regard this question of possible protection of the heart. This is the PREVENTION OF STILL FURTHER INJURY to a heart that has been damaged by some previous inroad of the streptococcus rheumaticus but is still capable of doing satisfactory work. The threatened attack comes sometimes from the same germ of rheumatism as caused the initial endocarditis, but reference is now had to the dreaded *streptococcus viridans*. Bacteriologists have found that a diseased tonsil, an abscess about the root of a tooth or that pus-producing infection of the gums known as pyorrhœa is the favorite camping ground of this deadly germ. It may well be called deadly because when it gets into the blood of an individual with a valvular defect and finds its way to the unhealthy valve, it is pretty sure to set up such an incurable process that it is

spoken of as Malignant Endocarditis (see Chapter VI).

You say, perhaps, "Why do you keep harping on this theme?" Because it can not be driven home too strongly, that the prevention of heart disease means in many cases the prevention of still greater damage. Just as an automobile, that has been wrecked by a collision, may be repaired and rendered good for more service, provided, of course, it is carefully handled, so a heart that has suffered from rheumatism or some other infection may still be good for years of work, provided it is carefully handled, but if subjected to repeated attacks of rheumatism, and above all to the attack of the streptococcus viridans, it is bound to become irreparably damaged.

A gentleman of seventy-three who had had a leak of his mitral valves from the age of sixteen had, nevertheless, been able to lead an unusually active business life without apparently any special trouble from his valvular disease. At length when late in life he contracted a not very severe tonsilitis (in all probability his tonsils had been left unhealthy since his rheumatic endocarditis at the age of sixteen), he paid but scant attention to this mild sore throat. Nevertheless, it proved the beginning of the illness that cost him his life. As he had visited the Panama Canal a few weeks

before this tonsilitis, his fever and other symptoms were thought due to malaria contracted in the Canal Zone. Treatment of his supposed malaria did no good and at length this man visited another city, where the medical authority he there consulted had a blood culture made and from it diagnosed a streptococcus endocarditis. This germ was subsequently shown to be the terrible streptococcus viridans. The condition was declared incurable and not many weeks later the death of the patient proved the correctness of the prognosis.

Now, had this man been warned against the danger of such an infection and had his diseased tonsils been removed years before, he would, in all probability, have escaped his blood poisoning and enjoyed some years more of usefulness and of fishing, of which he was so fond.

His heart had not been perfect, to be sure, and yet, so far as its ability to do its work was concerned, it was sound. Adequate protection against this final endocarditis would have been to all intents and purposes a prevention of heart disease. Therefore, do not hesitate to get rid of any and every focus of infection from which you may absorb bacteria, in case you have a heart that has suffered what appears to be a trivial injury years ago.

If your tonsils are pronounced all right, but your gums are not, go to a competent dentist and have him get rid of the pyorrhœa. If he is suspicious of some of your teeth, have X-ray pictures (films, as they are called) taken of them, and if any show pockets of pus about their roots, have those teeth extracted. Only in this radical way can you be sure of ridding your mouth of the dangerous germs lurking in the abscesses. You can not afford to run the risk of further damage to your heart, faithful organ that it is, for the sake of retaining a few teeth that still look well but are in reality plague spots.

Remember, too, that if you have an appendix or a gall bladder that every now and then shows by pain, indigestion and possible light attacks of fever, that it is harbouring sparks of infection, it is well to have it removed by operation. Dr. Rosenow has grown streptococci from the mucous membrane lining the appendix and gall bladder, and by proper cultural methods and animal experimentation has produced disease of the very structures from which the microbes were obtained. Even if chronic inflammation of these parts does not permit bacteria to get into the blood stream and thus invade the heart, it does, nevertheless, by the disturbance it creates, often upset the orderly action and functional integrity of an al-

ready damaged heart. A heart already handicapped by a leaking valve may continue to functionate satisfactorily so long as it is not too heavily weighted down by burdens put upon it by other organs.

But you exclaim in amazement, "Will a heart that is not healthy stand an operation? Is it not dangerous to take an anæsthetic?" It can only be answered that many sufferers from organic disease of the heart have gone through an operation under ether for the removal of a sick appendix, gall bladder or for the cure of some female trouble that was preventing the heart from doing its duty satisfactorily and was threatening to break it down altogether. Better incur the risk of an operation skilfully performed under a safe anæsthetic than carry about in your system a focus of infection which is bound in time to ruin your heart completely.

Neglect no cut or scratch, but have it at once carefully cleansed and disinfected. Persons with heart disease due to the action of streptococci appear far more susceptible to reinfection than are other individuals. A man was once seen with incurable endocarditis that originated in a neglected cut on the hand and such instances serve to emphasise the wisdom, nay! the necessity of exercising the greatest possible precaution against



what appears to be but an insignificant injury. Better be overcautious than to wake up some day to the folly of trusting to nature unassisted by wise protective measures.

**PUBLIC PREVENTION.** You may think because there are Public Health Officials that you are not called on to do anything in the direction of aiding them in their efforts. But you can do much toward instruction of the ignorant or careless. If your child has a sore throat or so-called grippe attack, do not send him to school or permit him to play with his fellows, until all risk of spreading the infection is past. Do what you can to have schoolrooms and other places of public gathering adequately ventilated. Do not complain if street cars are not shut up tight and do not object to fresh air in offices, shops, churches, places of amusement, etc. Remember the communicability of colds, coughs, grippe attacks, etc. Persons living in the open air and in climates conducive to outdoor life are rarely victims of epidemic diseases. These are house-born diseases, and if residents in closely packed centres of population were not compelled to live and work in overcrowded, ill-ventilated buildings, it is likely that most of the epidemic infections, such as scarlet fever, pneumonia, measles, tuberculosis, etc., would practically disappear.



You may think all this endeavour to eradicate such diseases an idle dream and that your individual efforts in this direction are utterly useless, but if the day is ever to come when streptococcus infections are to diminish, it must be through individual care of one's self and one's dear ones and by individual co-operation with Health Authorities.

Unfortunately, there are numbers of misguided persons, some of them legislators and teachers, who believe disease "an error of the mortal mind" and these honest yet mistaken persons permit their children to attend school and homes when actually sick with scarlet fever, diphtheria or other infectious complaints. If you are not one of these, combat their pernicious practices to the best of your ability both by public instruction and by keeping your children away from contact with the children of such misguided individuals, whenever epidemic diseases are prevalent in the community.

The foregoing measures may not wholly prevent streptococcus and other germ diseases of the heart, but they will accomplish much toward your protection and that of your sensitive little ones against those influences responsible for the multitudes of children, now doomed to death or invalidism from disability of the vital machinery of life.

## CHAPTER IX

### WHY THERE IS SO MUCH HEART DISEASE AT MIDDLE AGE

WHEN you read that the average length of life is increased over what it was two or three hundred years ago, you naturally wonder if it is because more people reach advanced age than formerly. It may well be that isolated examples of great longevity were seen a few hundred years back that equalled or even surpassed those of to-day. Thus a certain James Parr of England, who lived in the sixteenth century, died at the very unusual age of 157 years, and Metchnikoff in his book, "The Prolongation of Life," mentions several instances of persons who lived to be considerably over a hundred. But the great bulk of humanity did not, two or three centuries ago, reach old age. Pestilences of one kind or another, as well as the frequent wars of those times, killed off vast numbers of persons before they attained even middle age. Infant mortality was far greater than it is to-day and Heaven knows it is far too large even in these times of

enlightened sanitary science and more or less strictly enforced health laws.

The increase in the average length of life is due, not to the remarkable longevity of a few individuals as compared with the whole mass, but is the result of conditions which permit a far greater number of individuals to reach maturity and even to live to attain the threshold, so to speak, of middle age. There is, as it were, a tendency to a greater evening up in the matter of the age at which death overtakes the most of us. There are certain momentous facts, however, that confront us and which should make us pause and consider whither we are tending in these times.

These facts may be condensed into the statement that diseases of the heart, blood vessels and kidneys are on the increase in this country. This assertion is not based on the observation of physicians, although their experience furnishes corroborative testimony to the accuracy of the declaration, but is founded on the statistics of Life Insurance Companies. Thus in the *American Journal of Public Health*, vol. 3 for 1913, it is stated by L. I. Dublin of the Metropolitan Life Insurance Company that in the ten years ending with 1910, deaths from apoplexy and hæmorrhages into the brain had increased 18.8 per cent, while the mortality from organic disease of the heart

had increased 39.3 per cent and the deaths from Bright's Disease 18.1 per cent. The most surprising increase in mortality was shown in diseases of the arteries, which had risen from 5.2 to 25.8 per cent.

The figures just given include deaths from disease of the heart, blood vessels and kidneys. The reason for grouping these three classes of disease together is, as you know, that the heart, blood vessels and kidneys form component parts of what is known as the circulatory system. So intimately are they united that disease of one inevitably carries in its train ultimate disorder and positive disease of the other two. Thus organic heart disease of whatever kind sooner or later causes kidney disease with albumin and even casts in the urine. In the veins congestion and sluggish flow of blood result in time and so at length the whole circulatory system becomes disordered. In like manner, hardening of the arteries produces enlargement of the heart and altered function on the part of the kidneys, while that dreaded malady Bright's Disease more surely causes serious and often fatal enlargement and degeneration of the heart because blood pressure becomes greatly increased and when this is persistently raised the muscle of the heart grows thicker and for a time stronger in order to enable it to do increased work.

This sort of enlargement is Nature's way of helping the organ to overcome difficulties and for a time is beneficial. There comes a day, however, when the increased blood pressure and the enlargement of the heart reach a dangerous stage. Then we have either a giving out of the heart and death or we have such a powerful action on the part of this pump that in the brain a stiffened blood vessel bursts and apoplexy occurs. If the escape of blood from this ruptured artery is copious enough, death results, but if the hemorrhage into the brain is small the patient may live a more or less helpless paralytic, a condition in many instances worse than death. In still other cases the kidneys are the most seriously affected and the weakened heart being unable to force sufficient blood into the kidneys, elimination through this outlet is diminished and that form of blood poisoning known as uremia carries off the individual in convulsions or in such a profound unconsciousness that he can not be aroused and so sleeps his life away.

Whatever be the part, therefore, of the circulatory apparatus chiefly diseased, it is sure in time to affect and drag down with it the other parts. Consequently, disease of the heart, arteries and kidneys can not be separated and it is permissible to class diseases of all the parts under the one



head of heart disease. It is precisely this combination of kidney, blood vessel and heart disease that is liable to occur at middle age and which is on the increase in this country. Therefore, it is for your interest to get a knowledge of their causes that so far as possible you may avoid falling victim to organic disease before your allotted time.

Some of the causes of heart disease at middle age are well ascertained and definite, while others are obscure and intermingled with well-known and specific influences. These definitely ascertained causes are the already described infections. Some of these are general diseases, such as typhoid fever, inflammatory rheumatism, pneumonia, scarlet fever, diphtheria, influenza, etc. All of these diseases due to germs are very likely to start inflammatory changes in heart, blood vessels or kidneys, which weaken these, and with the wear and tear of years, lead to degeneration or hardening of their tissues. Medical men, who, under the name of pathologists, study the effects of disease on the various organs of the body, have made careful examinations of the tissues of persons dead of typhoid fever, pneumonia and other acute infections and have found microscopic evidence of the ravages left by the bacteria responsible for the illness. In pneumonia, for example, the muscle



of the heart is specially liable to inflammation which, if it does not lead directly to death, may so alter the make-up of the muscle fibres that they afterward are not able to contract as strongly as before. Typhoid fever was known many years ago to cause fatty degeneration of the heart, while more recently it has been discovered that the small arteries suffer damage of a sort that may ultimately lead to their hardening and inelasticity. Diphtheria and influenza are particularly injurious to the heart in such a way as to render it incapable of bearing unusual strain in after years.

In fact, any severe illness of an infectious nature may prove the beginning of changes that later in life appear as serious organic disease of some part of this mechanism on whose orderly working health and even life itself depend. What is equally important for you to know is that these acute infections may date back to childhood, so long ago that the individual has forgotten them or ceased to think of them as having any bearing on his health in later years. But you may exclaim, "What good does it do me to know this now, since I can not help what is already past?" Yes! that is true. You can not help what occurred in your childhood, but a knowledge of the possibility that your heart, blood vessels or kid-

neys suffered some damage then, should make you careful not to go on leading such a strenuous or perchance disorderly life as certainly puts unusual strain on these organs. As the saw has it, "A word to the wise is sufficient."

Then, too, there are the focal infections or localised diseases which, all unknown to the individual, may be exerting an injurious influence on his circulatory system. These may be not only the mouth or tonsilar infections considered in a previous chapter, but a chronic appendicitis, a disease of the gall bladder, or in women some pelvic disorder, or, in short, any local collection of inflammatory products from which bacterial toxins are being absorbed, may unfavourably affect the heart, blood vessels or kidneys. Not only do such centres poison, more or less, the entire system, but they would appear to be a factor in raising arterial tension or in so disturbing an already damaged heart as to further its complete breakdown.

Attacks of gall stone colic are distinctly dangerous to middle-aged people with weak hearts, and Dr. William Osler once stated that he had known a person to die from acute dilatation of the heart during such an attack. Physicians have really learned to recognise the seriousness of localised infections only within comparatively recent years,

and hence those doctors, who regard prevention as better than cure, earnestly advise their patients to get rid of these veritable plague spots by operation.

SYPHILIS is the one infection that most seriously and surely exacts toll of the heart and blood vessels. Just as the Submarine silently but unerringly sends its torpedo of destruction against an unsuspecting ship, so the germ of this widespread social disease silently and insidiously fastens its deadly hold on the muscle of the heart and on the coats of the blood vessels, especially the aorta. In the heart wall it produces areas of fatty degeneration, as proven by the discovery of the germ in such areas. In the coats of the aorta, inflammatory changes are set up that eventually result in that incurable dilatation known as Aneurism. This localised bulging of the artery is both painful and dangerous from the pressure it exerts on surrounding tissues and on the lungs. Furthermore, when syphilis shows itself in the heart or arteries it is in its late stage, often many years after the disease was acquired or is believed to have been cured.

When the heart and blood vessels have suffered in the way mentioned, energetic treatment may eradicate the syphilis from the blood and may possibly destroy the germs in the tissues, but it

can not restore the damaged parts to normal. Eternal vigilance and skilful medical management are then necessary to the preservation of what strength the heart muscle may have left. Therefore, if you are so unfortunate as to have acquired or inherited this terrible malady, do not remain content with the belief that you are rid of it simply because you see no evidence of it, but go to a specialist and have a reliable examination of your blood and spinal fluid by what is known as the Wassermann Test. Even if this be negative, that is, does not show the disease, you should from time to time repeat the test and resort to periods of treatment.

ALCOHOL is another poison which affects the heart and kidneys more or less injuriously, according to the amount that is consumed and the kind of drink in which it is taken. The heavy drinker of whisky, brandy or rum develops fatty liver and fatty degeneration of the heart muscle. In such, the effect on the heart is direct, while the man who indulges in one or two drinks a day, before meals, to stimulate his tired nerves and whet his jaded appetite, injures his heart indirectly through the effect on his liver. It is precisely such a moderate drinker who in time hardens and shrinks up his liver until it becomes what is known as a *Hobnailed liver*. The organ then is

so hard and thin that the blood is unable to flow up through it to the heart and the water of the blood leaks out of the overloaded abdominal vessels and the belly fills up with dropsy. This condition soon has an injurious effect on the heart, which becomes weakened and dilated. Jaundice also makes its appearance and the bile in the blood adds its poisonous effect on the heart, and the man ultimately pays the price of death for his indulgence in strong drink.

The alcohol levies its tax on the kidneys also, but it is gin that works special havoc on these organs. The oil of juniper, or of the sloe berry, contained in gin is an irritant to the secreting cells of the kidney and the man who daily takes his gin phiz, or gin cocktail, is sure in time to have Bright's Disease. This is shown by the fact that albumin may appear in the urine sometimes after a single drink of gin in his favourite cocktail just before dinner.

Wines, by reason of their containing less alcohol, are, with the exception of champagne, not so injurious, but these differ in strength and may work harm if drunk in excess. Beer contains from three to six per cent of alcohol and when taken in immoderate quantities, as in Germany or by beer drunkards in this country, is likewise injurious to the heart. Not only is the vital pump



required to drive abnormally large quantities of fluid through the vessels and out through the kidneys, but beer contains a relatively large proportion of sugar and other nutritive ingredients, so that when taken in excessive amount, several quarts a day, as is the habit with some old beer toppers, it creates fat. Consequently, the heart becomes fatty and, because of its excessive work, enlarged. In Germany it is not at all uncommon to see heavy beer drinkers die of dilated and fatty hearts. Finally the habit of taking a "night cap" just before retiring is very bad, since the toddy whips up the heart and, by making it beat faster than it should, robs it of needed rest, for this organ works while all others are at rest during sleep and is permitted to get its time for rest only between beats. Nature has ordered that the action of this vital organ should slow down during sleep and if the customary toddy, just before you lie down for your night's rest, keeps the heart beating more rapidly, that is, more often than nature intends it to, it is being overdriven. Like any man-made machine, the heart that is habitually overworked will the sooner wear out. The human pump will and does stand a terrible lot of abuse, but in time it rebels and then exacts tribute from its inconsiderate master by some one of the many ways in which it shows it is wearing



or is actually worn out. Beware, then, how you allow your indulgence in alcohol to spur on this willing and sensitive organ, so vital to health and to life itself.

**TOBACCO.** The question is often asked if the use of tobacco injures the heart. This is a mooted question, since it is difficult to determine in a scientific manner just what the effect is, and, moreover, it is intimately connected with other influences. The effect seems to depend on how much tobacco is used and how it is used. We are considering the habit of smoking, and not chewing, since the injurious effect, if such there be, depends on certain chemical products developed by combustion.

If a boy takes to smoking cigarettes and especially to inhaling the smoke, as the average cigarette smoker does, he is very likely to find, before reaching adult age, that he has developed some of the symptoms of "The Tobacco Heart": namely, pain and uneasiness in the region of his heart, a rapid, pounding or even irregular pulse, dizziness and perhaps more shortness of breath than is comfortable on exercise.

An eminent French authority on diseases of the heart wrote a good deal on this subject and he declared very positively that the excessive smoking of tobacco produces a really dangerous form

of heart pain called *Angina Pectoris*, and also that it tends to hardening of the arteries. However this may be, you can believe it is the abuse and not the mere use of The Weed that is bad for the heart.

If smoking a single cigar produces palpitation, it is injurious and you should let it alone. If you already have some heart weakness or too high blood pressure, then, by all means, cut out your tobacco, since its further use can only do you harm. Lastly, by inhaling the smoke you absorb much more of the poison than if you smoke without inhaling and it becomes doubly injurious to your heart.

We now come to some influences which, although not as definite as the causes that have been described, are yet of no uncertain effect and which probably account for the increase of heart disease noted by physicians and statisticians. These influences are intimately connected with the changed social and business habits of modern life and may be summed up in the two words, *strenuosity and luxury*. A century or two ago people led a more quiet and natural existence than nowadays. They walked more, took business less strenuously, drank more liquor perhaps, but took their social diversions more sedately and, in short, drove their bodily machinery less hard.

If you are forever on the jump, so to speak, you are like the engineer who is running his engine faster and harder than it was built to run. The high-power locomotive is not driven twelve hours on a stretch, but after a run of perhaps four or five hours is sent into the roundhouse to rest and cool off. The heart likewise requires its time for rest and recuperation, and if you are working at top notch all day, as does the busy man of affairs, and then if you attend banquets, theatre parties, followed by midnight repast at some hotel or restaurant, you are driving your engine too hard and some day you are going to find out that heart, blood vessels or kidneys, or all together, are showing unpleasant signs of being worn out. Your life is too strenuous and some day a bearing or a joint is sure to break—then you will be brought up with a jolt.

If you are a woman, forever on the go, attending clubs, social functions, theatre or opera, in addition perhaps, too, paying at least some attention to your family demands, you are not only going to grow old prematurely in appearance, but you are also overdriving your machinery.

If worry is added to hurry, the combination is particularly bad. Many a wife driven well nigh beyond physical endurance is worried over the health of a child or over household expenses and,

consequently, carries a heavy heart in her breast. This is figurative, and yet it is not far from the truth, for whatever depresses the spirit also depresses the heart, and when long continued, tends to weaken the heart. People have been known to die of shock occasioned by sudden distressing news, and the simple explanation is that the already weakened heart was brought to a standstill through the effect of grief on the nerve, the function of which is to slow and depress the heart. When a piece of bad news is followed by death it has depressed the heart beyond its ability to recover. Many a business man has traced his heart trouble to prolonged or unusual anxiety over business. Therefore, if you are of a worrisome disposition, cultivate a hopeful frame of mind. Worry never does any good. Worry never helps you to overcome difficulties. It only takes away your nerve, so to say, and incapacitates you for putting forth your best efforts. Besides, it undoubtedly does contribute powerfully to heart disease at middle age if not before.

Another factor in the production of a weak heart and a bad kidney is a too luxurious mode of life. Long before doctors were talking about a too high blood pressure, as they do nowadays, a celebrated German physician laid great stress in the production of heart disease on over-eating,

indolence and all those forms of self-indulgence that make up a luxurious mode or habit of life. If you habitually eat more food, especially meat, than your system can appropriate as nourishment or than your body can burn up, by reason of insufficient exercise, you are like the poor fireman who over-stokes his engine. Then, if in addition, you do not attend to a thorough elimination through skin, bowel and kidneys, you are allowing your flues to become choked by the products of incomplete combustion. The result is that the machinery of life becomes clogged and soon or late fails to work smoothly and up to its full capacity.

To be exact, you are likely to take on corpulence, particularly abdominal corpulence, your blood pressure rises perhaps to a dangerous point, your blood vessels feel the strain and grow stiff, your kidneys have to excrete more waste matters than is good for them, and are over-stimulated, and at length the heart, which in consequence of all this has been compelled to do extra work for years, becomes enlarged, perhaps fatty and unable to pump the blood onward as vigorously as it ought. You may begin to puff and blow when you hurry or climb stairs, for instance. If so, your heart is showing signs of overstrain and demands to be relieved.



Finally there is another habit on the part of many persons that is believed to exert a good deal of influence on the blood vessels. This is chronic constipation. Metchnikoff, to whose utterances is really due the widespread use of buttermilk in this country, has written a good deal on the injurious action of the host of bacteria inhabiting the large bowel. He believes that this part of the intestines is not only not necessary to civilised man but is, in fact, a menace to health and even life unless its contents are kept from accumulating and thus allowing the germs in it to send their poisons throughout the body.

Metchnikoff may be too extreme in his views, but physicians see the baneful effect of insufficient elimination through the bowels and kidneys. These are like the sewers of a city intended to carry off waste and poisonous matters, and you should not allow them to get clogged any more than you would the sewer pipes of a city or the flues of a steam engine.

At all events, it is not uncommon for physicians to see individuals with stiff, wiry blood vessels who are old before their time and in whose history no cause for their condition can be discovered aside from habitual constipation and the excessive use of meat, which kind of food, according to Metchnikoff, provides the very sort of



waste material on which the bacteria in the lower bowel thrive and multiply. Therefore, you should correct this insufficient elimination by exercise, regular habits, the drinking of plenty of water and a diet composed mainly of fruits, vegetables and whole wheat or mixed bran and graham bread. Laxative pills and other cathartics only increase the difficulty.

Think how many people there are in whom all the foregoing agencies are at work: namely, acute or chronic infections, even syphilis, the use of alcohol, the abuse of tobacco, strenuous living in one way or another, worry over great financial or domestic cares, too hearty an appetite and lack of sufficient outdoor exercise, with increasing abdominal corpulence. Think of all these multifarious influences and then wonder if you can why there is so much heart disease after the age of forty. If this picture applies to you, then seek your physician and take an inventory of your physical stock before you find too late that it has been exhausted.

The engineer does not run his engine year after year without a careful inspection of the boiler, at least to see if it is growing thin, or is in need of cleaning. The careful chauffeur does not drive his automobile day after day, week after week, on the mere assumption that everything is all

right. And yet there are millions of persons, of whom perhaps you are one, who go on year after year in ignorance or blind confidence that nothing is wrong with their machinery simply because it does not give an audible or unpleasant squeak, as it were. Some part is feeling undue strain or is showing wear and surely giving indication of outspoken disease in after years.

If you are a hard-worked man or woman, a busy man of affairs, a strenuous wife, mother or club woman, you should have an annual examination to ascertain the weak spot in your machinery. In this way much might be done to lessen the insidious approach of disease. Be not like the ostrich which burying its head in the sand fancies it is safe.

## CHAPTER X

### SYMPTOMS ABOUT WHICH YOU DO NOT NEED TO WORRY

**F**EW sensations create so much apprehension and even genuine alarm as pain in the region of the heart. This will induce a person to consult a doctor who otherwise might never give his heart a thought. In many cases the decision to have medical opinion is wise, but in the hope of allaying unnecessary fear regarding the gravity of this sensation as well as some others, this chapter is written.

The pain here referred to is variously described by sufferers. It may be a sudden, sharp pain like the thrust of a knife, or it may be dull and boring, or it may feel as if the heart were suddenly clutched by a hand or squeezed in a vise. The pain may last but a moment and be spoken of as a sharp stitch, or it may persist for a much longer time, even for several hours, though rarely with uniform intensity. In some instances the pain spreads into other parts of the left side or up to the shoulder and down the left arm, and on

disappearing it may leave the arm feeling numb. To describe all of its peculiarities is impossible, but you may take the foregoing as its commonest manifestations.

Generally the pain is closely followed by rapid, violent pounding of the heart and even by a terrifying sensation as if the heart stops altogether for an instant and then begins again with a bound into the throat. This momentary pause or intermission is, of course, due to the inhibitory action of the pneumogastric nerve which, as described in Chapter II, inhibits the heart under the influence of the fear generated by the pain. Now and then the attack may be accompanied by fainting, though consciousness is rarely lost completely. When these alarming feelings occur at night, as they not infrequently do, the individual is so frightened that she screams out and even declares she is dying. You note it was said she screams out, etc., but this is not because these attacks are confined to women: they only occur rather more frequently among them than among members of the male sex. For your comfort, if you are a woman, let it be said, such attacks sometimes occur in big, strong men, some of them physicians who appear no less concerned than would be one of their patients.

It is not at all unusual also for the feet and

hands to become cold and for the face to look pale, anxious and even pinched, which by the friends may be taken for the look of impending death. The sufferer may lie immovable during the attack, being afraid to stir lest the heart stop altogether. Sometimes the person moves restlessly from side to side, moaning with pain and in terror of death, the icy coldness of the extremities seeming to confirm the nearness of the end.

To the Laity such attacks are truly frightful and the alarm of the family adds very naturally to the apprehension of the sick one. Unfortunately, too, the situation is often rendered all the worse by the behaviour and ill-concealed concern of the doctor, who hurries to the bedside in response to a hasty summons. Knowing nothing about the previous health of the sufferer and implored to "do something quick," he feels the pulse, notes its rapidity and perhaps intermittence, as well as the pallor and anxiety of the countenance, and not knowing but the person may really have serious heart disease, he hastily prepares and administers a hypodermic. Then as the remedy brings relief he gives a sigh of satisfaction. If he be young and inexperienced in such cases he may actually mistake the seizure for a much more serious one than it really is and may let fall a remark to the effect that he was called

not a minute too soon. This, of course, fastens in the mind of the patient the belief that she really was in imminent danger of dying, and henceforth subsequent attacks arouse still greater terror. A fear is implanted in her mind which almost no amount of reassurance by another physician can eradicate.

Take to yourself the comforting assertion that in practically all cases attacks as here depicted are not dangerous and generally do not mean heart disease.

If you are young and have previously been well and if you have some sore spots in the region of your heart, these frightful sensations are probably a manifestation of irritation and inflammation of the intercostal nerves or those nerves which leaving the spinal cord pass around the side of the chest between the ribs, as the word intercostal signifies. In front near the heart these nerves send small branches to the skin and these are the nerve fibres that give the sensation of pain, clutching, weight, oppression, etc.

Even when there is actual heart disease these intercostal neuralgias may occur, but in such cases there is a possibility of a more serious condition, and if you have reached the age when heart disease is possible, or if you have had inflammatory rheumatism, you will do well to seek



the advice and help of your family doctor. The condition responsible for these attacks is usually found outside the heart and chest in digestive disorders, throat or mouth infections, anæmia and so forth. For your own peace of mind and that of your family, seek medical assistance, but do not get alarmed when you have such a spell if you can possibly help it. Often a hot water bag over the heart and a drink of hot water will give some relief until the physician arrives and if necessary administers some more efficacious remedy.

SUDDEN ATTACKS OF PALPITATION or dropping of heart beats are a second very common cause of fear lest they mean disease of the heart, and, of course, you and no one else desires to have anything wrong with this pump on whose orderly operation the whole machinery of life depends. But do not be alarmed if you do feel your heart cut up some queer capers now and then, such as jumping up to the throat, pausing for a second or two and then starting again with a strong throb against the chest, or stopping and starting irregularly for a few minutes or even racing away as if mad. These various disturbances of heart action are generally no cause for great alarm, for as a rule they do not mean organic disease of the heart.

Attacks of palpitation or intermittence of the

pulse are mighty uncomfortable and you may wish to have the advice of your regular physician, which, of course, is a very proper thing to do. But do not get into a panic over them before you really find out what they mean. In the majority of instances these vagaries of heart action result not from actual disease of the pumping mechanism but from some derangement in the function of other organs. This is especially true if the attacks occur at times only and are not habitual.

If you have not had infections likely to cause injury to your heart and if you are still young and vigorous you need not apprehend that there is anything wrong with your heart other than that there is something wrong with its gears, so to speak. But if palpitation persists and particularly if you are middle-aged or even older, then see your doctor and have the friction removed and your heart's action set right. Occasional attacks of disordered function may not injure a sound heart, but to an already unsound heart they may do actual harm if permitted to go on uncorrected. Nevertheless, remember not to get scared until there is actually something to get scared about, for fear on your part will only aggravate the difficulty by keeping up the palpitation and unnerving you. There are certain forms of palpitation

that are serious and these you will find described in a succeeding chapter.

A FEELING OF NUMBNESS in a hand or foot is another sensation that often occasions alarm lest it may mean the person is going to have paralysis. Sometimes the patient wakes up at night with the feeling of his limb or fingers being asleep, but usually the sensation of numbness is felt when the individual is awake. Should you experience this feeling, do not allow it to disturb your equanimity for it does not portend paralysis or any disease of the heart. When you awake and find your hand or foot asleep, it is probable you have held the member in a cramped position or have lain on it in such a way as to interfere with the circulation in that particular part of your body. Ordinarily, however, numbness of fingers or other parts is purely a nervous manifestation and the hand or foot is found on examination to have adequate flow of blood through it. Just what disturbance of the nervous system this means can not be explained here and a specialist in nervous diseases had better be consulted if you have this annoying sensation often or persistently.

COLDNESS OF THE HANDS OR FEET is still another symptom that people call "having poor circulation" and which takes them to a doctor. In one sense it does mean poor circulation, but this

poor circulation does not generally indicate heart disease. It is simply a local affair and in the majority of cases is dependent upon some intestinal intoxication as from chronic constipation. Attention to the bowel, a change of diet and the drinking of a good deal of water, possibly, too, the taking of less coffee or tea or the use of less tobacco, will be found to warm up the parts. If the condition is so severe as to produce deathlike whiteness and icy coldness of the fingers you will do well to see your doctor and get it corrected. But find comfort in the statement that it does not mean heart disease.

DIZZINESS is a symptom that not only is very uncomfortable but generally frightens a person lest it denotes some form of heart disease. As a matter of fact, this vertigo is rarely a manifestation of cardiac disease and when it is such is attended by other symptoms of so pronounced a kind that the dizziness is overshadowed. You may take it as a general rule that swimming of the head is due to one of the three following things: some defect in sight, disease of the ear or intestinal intoxication.

If you happen to experience a feeling of dizziness on sudden change of position, for instance, on lying down or rising from the recumbent posture, you will probably relieve it by taking a good

physic and by reducing the amount of meat or eggs in your diet. Should that not afford you relief, then consult an oculist or specialist in diseases of the ear and have those organs carefully tested. If you have that defect of vision known as astigmatism and are not wearing glasses that correct it, then by all means go to a specialist in eye diseases for a pair of glasses and not to an ordinary optician, for the latter is not usually able to specify lenses so accurately as an oculist. An accumulation of wax in the ear sometimes causes vertigo by its pressure on the ear-drum. Of course, there may be other conditions connected with the ears or eyes responsible for the dizziness and these can be discovered only by a competent specialist.

There is a condition connected with the circulatory apparatus that sometimes gives rise to dizziness, and this is an abnormally high blood pressure. Therefore, if you are of middle age and have stiffer arteries than you should, go to your physician and have your heart and blood vessels examined, and see to it that he takes your blood pressure. It may be the premonitory symptom of trouble you should have corrected if possible. But do not conclude at once that this is your special trouble. Only remember that "Eternal vigilance is the price of safety." The caution



just uttered is intended for elderly or aged persons and not for you if you are still young and vigorous. In the latter event your dizziness is most likely to be a symptom due to indiscretion in diet or to failure to keep your flues well cleaned.

The Colon Bacillus is a germ inhabiting the large bowel or colon and, as Metchnikoff has pointed out, it finds a meat diet to be just the kind of provender suited for its growth. A doctor found his annoying vertigo was due entirely to his consumption of meats and other foods rich in what physicians term *Protein*, that is, a predominance of nitrogen as compared with starches and sugars contained in vegetables and fruits. In this particular instance this doctor was compelled for months to subsist exclusively on a vegetarian diet including a liberal allowance of buttermilk.

However this may be in your case, do not, as urged with regard to other symptoms, permit yourself to get alarmed over what may prove an easily remedied state of things.

RUSH OF BLOOD TO THE HEAD or a feeling of sudden fulness in the head is occasionally thought by persons to indicate a tendency to apoplexy. It is not, except now and then in individuals who have dangerously high pressure of blood in their vessels and hence in the arteries of the brain. In



those whose vessels are still young and elastic this transient feeling of fulness in the head is most likely evidence of overwork, insufficient bodily exercise, a too rich diet, the abuse of tobacco or some other condition not connected at all with the heart or arterial disease. Nevertheless, see your physician and learn what is wrong in your mode of life.

HEARING THE BEATING OF THE HEART OR A POUNDING IN THE EARS is a symptom sometimes complained of and thought to indicate something wrong with the heart. In a previous chapter is mentioned the instance of a lady who was much concerned whenever the pulsation in her ears ceased. She feared it meant a weakening of her heart. In the case of the symptom now considered, just the opposite occurs. The individual has been unaccustomed to hearing his heart beat and when all at once he does begin to hear it, he is impressed with the belief that the pumping machinery must be seriously out of order.

In some persons the unpleasant pulsation in the ears is perceived only when the action of the heart is increased by excitement or upon walking, while in other instances the pounding is heard only when the person lies down and perhaps then only when lying on a certain side. If perchance this unpleasant sensation is one of your symptoms,

take to yourself the comforting assurance that in nearly all cases the throbbing in the ear is caused not by anything wrong with the heart but by some defect in the ear, as a stiffening and retraction or indrawing of the drum of the ear in consequence often of a chronic catarrh or inflammation of the middle ear. You may be quite sure of this if the pounding occurs in only one ear. You then should consult an ear specialist.

Persons with abnormally high blood pressure may sometimes hear their heart pound in the ears, in both, not merely one. If you chance to have too high blood pressure or are at the age when such is likely and you are conscious of this pulsation in your ears, then seek your physician and get his advice that you may learn to avoid what may aggravate that condition and how to spare you from the sad results of raising your arterial tension still higher.

No apology is needed for the oft-repeated injunction not to get into a panic or not permit yourself to become alarmed over some symptom which seems to you to indicate heart disease. If you saw the evil effects of fear as we doctors see them, you would comprehend why so much warning against it is given in these pages. It is not at all uncommon for a person to admit that he feels his pulse and thereby keeps tab on its rate

and deviation from what he thinks normal. This habit is most pernicious, for not only does it tend to make one self-centred but one's very concentration of his attention on his pulse causes it to become altered in rate or rhythm.

The following is an excellent example of the kind. A young woman suddenly had her attention directed to her heart by feeling it give a skip and at the same time noticed that her hands were cold and moist. Alarmed by these unusual feelings she at once sought a doctor, who told her she had a leak in her heart. From that time on she never lost consciousness of her heart for any length of time, but kept her finger on her pulse almost constantly. One day she counted it and finding it 104 to the minute grew so frightened that she went into a nervous chill and, of course, her heart remained rapid by very reason of her fear. Finally an examination by another physician resulted in the assurance that she had no leak and no organic disease of the heart, and she went away declaring she was better already. Hers was a plain case of fright aggravated by her habit of feeling her pulse and thus riveting her attention on her heart. Let this instance be a lesson to you, and if you incline to worry over some symptom, practise autosuggestion and cure yourself of worrying.

## CHAPTER XI

### SYMPTOMS TO WHICH YOU SHOULD GIVE HEED

IT is not desired to alarm you in case you happen to have some of the symptoms to be considered in this chapter. They will be mentioned in order that you may appreciate their real significance and may be enabled to take such steps as promise to lessen them or prevent them from being neglected and thus made worse perhaps. Some of them are due to other conditions than disease of the heart, using this term in its general sense, and when possible these other conditions will be stated.

SHORTNESS OF BREATH or *Dyspnœa*, as we doctors term it, is in most cases the first indication of weakness of the pumping power of the heart, and yet breathlessness on exertion is by no means confined to persons with heart disease. So, in order to relieve your apprehension at once, in case you notice you are short-winded, let it be said that this symptom can and often is felt by persons who are weakened by other causes. Thus it is very common in those who are anæmic, in-

sufficiently nourished, debilitated by a recent illness, unused to physical exercise or who have a faulty habit of breathing. It is very apt to result from some form of lung disease or a faulty conformation of the chest or in persons who are too stout. Yet in any case dyspnœa on an amount of exercise that previously failed to produce it, should lead you to seek medical advice to ascertain its true cause.

Shortness of breath from disease of the heart in its early stage has nothing peculiar or distinctive about it. The individual feels entirely comfortable when at rest, but on hurried walking, mounting a flight of stairs or breasting a strong wind, carrying a heavy package, etc., notices quickened breathing and a sensation as if the chest were too full for comfort. It is just what we all have experienced many times on running to catch a train, it may have been. On resting for a few moments the breath again comes easily and the discomfort disappears. Yet if your heart be at fault you will perceive probably that it is beating faster and harder than usual or that as it slows down it gives a throb or two.

Should your colour grow dusky or the veins in your neck stand out like dark cords, the right side of your heart is over-strained and very likely dilated, and if you have had rheumatism or some



other of the acute infections capable of producing heart disease, go without delay to your doctor and find out just where you stand.

This breathlessness in a person of middle age or one with known high blood pressure is often an ominous sign of approaching trouble. If you are well on in years do not neglect it or even if you are too corpulent do not attribute your shortness of breath to your weight, for it probably means that your age or your weight has begun to tell seriously on your heart. This precaution, if acted on months earlier, perhaps would have saved many a man or woman from serious trouble.

If your child has suffered from rheumatism of the heart, watch him while at play and if his breathing is more rapid and laboured than is natural to a healthy child, have his heart examined, for a young child will play or run in spite of pronounced dyspnœa and make no complaint. As a rule, children do not complain unless in actual pain or positive distress that really incapacitates them for the enjoyment of their pastimes.

ANGINA PECTORIS is a pain of a totally different kind and significance from that described in the preceding chapter. This is a symptom of which you must take heed if you are elderly and in particular if you are a man. This pain is of various degrees of intensity, being in some cases



hardly more than a sense of tightness or pressure, while in others it may be so severe as to cause well-nigh unbearable suffering. It is felt in the upper middle portion of the chest behind the breastbone. It is described by physicians, therefore, as *post-sternal*.

Most persons who experience it for a first time notice hardly more than the oppression or tightness mentioned, but now and then the individual, even in the initial attack, is brought up by a truly ferocious agony that beginning at or near the upper part of the breastbone spreads into the left shoulder and perhaps down the left arm. Sometimes the pain extends through to the back of the neck or even into both arms. The distress is described by some as a feeling as if the chest were being squeezed in a vise. Exceptionally the pain starts not in the chest but at a wrist or elbow and then radiates into the chest.

Now do not confound this viselike constriction of the chest with that similar sensation sometimes accompanying intercostal neuralgia which, described in the chapter preceding, usually starts near the heart and is not infrequent in nervous, anæmic women. That pain, you recall, is a frequent symptom found in persons below the age of forty, though by no means confined to them. This angina pectoris occurs for the most part in

men or women beyond fifty, generally at or past sixty years of age. Furthermore, intercostal neuralgia may come on at any time, day or night, and even when the person is perfectly quiet physically and emotionally, although in some instances it may be evoked by walking or some other form of exercise that causes the sensitive nerves to be pinched by muscular contraction.

The chest pain or distress now considered is in nearly all cases excited by the act of walking, especially hurriedly or against a head wind. When it is scarcely more than a slight feeling of weight or pressure in the upper and central portion of the chest it is often thought to be but a symptom of indigestion or even an indication of beginning asthma, particularly if the man feels also as if he could not get his breath easily. But if perchance you find this description to fit your own case and you have reached the age when angina is common, do not ignore it. You may, if it is not pronounced, be able to continue with your walk and, therefore, may flatter yourself it is of no consequence. But do not deceive yourself. Go to your physician and from him ascertain its true significance, for if it is the real thing you can not afford to go on in ignorance of its true meaning and portent. You may shrink from the truth, but the truth can not hurt you and may

be the means of saving you and yours much greater suffering. Remember, there is no desire to frighten you, only to warn you and by putting you on your guard help you to avoid what will probably aggravate your difficulty.

SWELLING OF THE ANKLES is another symptom that you should not neglect, not because it is invariably a sign of heart disease, but because it may be, and only an examination by a competent doctor can determine its cause and help you to rectify the condition responsible for the impediment in the circulation.

Slight puffiness of the ankles is not uncommon in those persons who are very heavy or whose occupation compels them to stand for hours without moving about. Such a puffiness or slight swelling is due mainly to the force of gravity acting in conjunction with muscular inaction. It is a manifestation of sluggish flow of blood in the capillaries. Occasionally it may be caused by too tight garters constricting the leg higher up between the calf of the leg and the knee.

The swelling of the ankles now referred to is quite different as shown by the fact that pressure upon the swollen part leaves a dent the same as does pressure on a lump of dough or putty. When this is the case, the condition is one of dropsy or œdema, as we doctors say. Now dropsy of the

ankles is not always a sign of heart disease, but it is a token of sluggish circulation, that is, poor return flow in the veins back toward the heart. A not very infrequent cause is found in varicose veins of the leg and then the swelling is apt to be confined to, or more marked in, one ankle. Sometimes this localised dropsy is a manifestation of kidney disease, especially if the arteries are stiff or the blood pressure too high. In some cases it is due to thinning of the blood, anæmia that is, and sometimes to a chronic rheumatism of the ankles.

But this "pitting" of the ankles, as it is called by physicians, is in very many instances a beginning sign of weakened driving force on the part of the heart, and should be given due attention. It is quite characteristic for this swelling to develop toward evening or after the person has been up and about and then to disappear over night when the position in bed aids the return flow to the heart.

If you are an elderly person or if perchance you have been told you have some form of heart disease and you notice this pitting of the ankles, no matter how slight, then do not ignore it. It may have some easily remedied local cause, but is more likely to be a sign to which you should give heed promptly. A gentleman well along in

the eighties once wrote that he was suffering from gout in his feet because they swelled toward night and became very painful. It required no examination to determine that the condition was not gout but the leakage of the water or serum of the blood out from the vessels into the tissues. In this particular instance it was a serious affair and betokened disease both of the heart and arteries.

INCREASED URINATION at night is a symptom demanding consideration in this place. Many persons find it uncomfortable to retain their water all night from one cause or another, and yet when such is the case, there is fault somewhere. It may be you drink a good deal of water during the evening or just before retiring, or your urine may be acid and irritating, or you may have chronic irritability of the bladder or prostate gland. Such causes of nocturnal urination are easily remedied. But the condition now under consideration is a true polyuria or abnormal increase in kidney secretion during the sleeping hours and at a time when normally the action of the kidneys is lessened owing to a diminution in the pumping force of the heart.

*Nocturnal polyuria*, therefore, is, in many cases, particularly in persons whose blood pressure is too high, a symptom demanding attention. It is often an early and significant sign of kidney disease or



of generalised disease of the entire circulatory apparatus.

Therefore, if you are approaching middle age and still more if you are turning the corner from middle to old age, do not neglect this symptom. Treatment may lessen the condition responsible for it, but if not, the advice of your doctor may enable you to keep the underlying disease from progressing. At all events do not put off or scorn medical aid altogether.

A FALLING OFF IN THE QUANTITY OF URINE secreted in twenty-four hours is quite the opposite state of things from that just discussed. This is especially apt to occur in persons with organic disease of the heart, particularly valvular disease. You may find your kidney action deficient from a variety of causes which have to do not with a defect in your pumping machinery but with some fault in diet or the habit of drinking too little water or profuse perspiration as in hot weather, but if these causes are absent in your case and you know you have some cardiac defect, then go at once to your medical adviser and find out what is the matter. It may be your heart, and, if so, give heed to it before it is too late.

ATTACKS OF RAPID HEART. There is a form of palpitation to which physicians have given the name of *paroxysmal tachycardia* because the ex-



treme rapidity of heart action sets in abruptly and after persisting for a variable length of time ceases as suddenly as it began. This "rapid heart," as it is sometimes called, depends upon some radical defect in the organ, although this can not always be determined by medical examination during life. In other cases it is found in association with easily recognisable lesions as a degeneration of the muscle or a damage of a valve.

Do not confound this sort of palpitation with that depicted in the preceding chapter, for its significance and its results may be, and indeed are, very different. In this there is some structural alteration of the heart at the bottom of the paroxysm, while in the other kind of palpitation the disturbance is due usually to some cause outside the heart. The rapid action now considered may run up to two or even three hundred beats in a minute and, when it persists for many hours, days or even weeks, as happens now and then, occasions not only alarm on the part of physician as well as patient but positive discomfort.

If you chance to have suffered with this type of palpitation you have learned very likely that medicines do not appear to exert much influence in arresting the attacks. Nevertheless, seek the aid of your physician, since if he can not cut short

the paroxysms he may be able so to treat your heart during the intervals as to render it less apt to run away with itself.

**NERVOUSNESS AND INDIGESTION.** There is no intention of asserting or even implying that the symptoms just mentioned signify heart disease. Far from it! They are complained of by hosts of persons who have nothing wrong with their hearts, so far as can be ascertained by examination, unless possibly a purely functional disturbance of its action. These symptoms are here mentioned because an individual with serious organic disease of his heart, arteries or kidneys suffers from what he calls "nervousness and indigestion" and thinks them the cause of his cardiac disorder. It may happen now and then that they do so affect a compensating heart as to bring it perilously near to becoming dilated and decompensated, whereas in other instances the individual has got "the cart before the horse."

If you have some form of heart trouble, whether you are young or old, and you find yourself growing unwontedly nervous and perhaps unable to sleep as well as previously, or if you find you can not digest your food as comfortably as usual, attend to these symptoms without needless delay. Seek the advice of your medical ad-

viser and learn whether or not these symptoms depend upon failing power on the part of your heart.

Do not fly off to some institution where such disorders of the nervous or digestive system are made a specialty of in way of treatment. A dilated, irregularly functioning heart deranges the circulation in brain and other nerve centres and particularly in the organs of digestion. The food tends to ferment in stomach and small intestines with formation of gas and acidity, so that appetite is lost and the individual feels bloated and distressed. This may be so particularly at night and then is often responsible for insomnia or disturbing dreams. The individual grows weak and nervous and if his breath grows shorter thinks this due solely to his bloating with gas after meals.

Consequently, if you suffer in this way, ascertain if your heart be at fault and if the doctor so decides, submit to treatment for the correction of the primary difficulty. When the organ really responsible for your symptoms has been set right, your nerves and digestion will also follow suit probably. Only after you have submitted to prescribed rest and other measures suitable to your heart trouble and then found your nervousness and indigestion have not been corrected, you will

do well to consult specialists for those disorders.

“Discretion is the better part of valour” is a proverb which should be remembered by persons with weak hearts. You may be ambitious to hold your own with your fellows in the race of life and hence prompted to forget your limitations. If so, you will commit indiscretions of one sort or another, and if you do you will surely pay for it. This is especially true of you elderly and old people. You do not like to admit that you are growing old or have reached the time when your physical powers are waning. But bear in mind the fact that it is the part of old persons to be discreet and that you do not show good sense by trying to appear young and by endeavouring to do things you know to be beyond your strength.

You, like hundreds of your fellows, may not have sought medical opinion as to the actual state of your pumping machinery. If so and you find your endurance distinctly on the wane, that your heart throbs unpleasantly and your breath comes a little less easily on an amount of exertion which you formerly bore without conscious difficulty, then regard these symptoms as something to which you should give heed.

It may be that only your flues need cleaning, but it may be your pump is being required to do more than it can well stand and that its walls

are growing thin or that its piston is beginning to leak a little. A competent medical examination should detect where the weak spot is and proper treatment may set things right by repacking the piston, so to speak.

If you are a young person and have passed through one or more attacks of inflammatory rheumatism and you notice some of the symptoms here mentioned, find out from your doctor if perchance your heart may not have suffered some damage in that attack of rheumatism. Do not wait until your horses are stolen before you lock your barn doors.

In conclusion, of fully as great importance as anything which has been said in this chapter, is the recognition of the added harm that may come to you from neglecting recurring sore-throats, grippe attacks and repeated though mild attacks of rheumatic pain, for they may be the forerunners announcing the insidious approach of the enemy seeking again to enter the citadel of your life.

Be not afraid of the truth, but be afraid of the foe that strikes in the dark or when you are off your guard. Remember that for you, with a damaged heart, no matter what be your age, "Eternal vigilance is the price of safety." If you know who or where your enemy is, you have a

far better chance of defeating him than if you remain in the dark. It is nonsense for you or your friends to say to the doctor, as is often done, "Do not tell him if you find he has any heart trouble, for it will kill him." The truth told gently and tactfully is far better than is ignorance of the real condition, since "to be forewarned is to be forearmed."



## CHAPTER XII

### IS IT SERIOUS, DOCTOR?

**M**ANY an anxious mother, when told her darling has heart trouble, has asked, "Doctor, is it serious?" Perchance you have a child or other dear one with some form of cardiac affection and are asking the same question in your heart if not in actual words. To this query the reply must be given truthfully, Yes! it is serious, but just how serious depends on several things and each case must be judged by itself. If by serious you mean, is the patient likely to die suddenly and unexpectedly? the answer is, Probably not! And yet here again the reply can not be absolute, for all cases of heart disease are not alike in form or degree of severity.

Acute rheumatic inflammation of the heart in a young child is not fatal at the time in the great majority of cases. The outcome is determined by the severity of the infection, the degree of damage the heart has sustained, as shown by the extent of dilatation, the prostration of the little sufferer and in great measure by the good sense

and wisdom of the parents in enforcing strict obedience to the directions of the physician or physicians in charge of the case. A wilful, fretful, ill-controlled child is far less likely to get well than is one who takes necessary medicines pleasantly and is willing to stay quiet as long and as absolutely as may be required. The parents of a sick child should require strict obedience, but do so in so wise a way and with such gentle firmness that the little sufferer is not aggravated and made to cry. And in this connection let it be said, everybody has to submit to the inevitable some time in his life, and if a child is taught that lesson early, he is saved much unhappiness in after years. Obedience does not mean loss of individuality and proper independence. It only means submission to restrictions or commands intended for the individual's good. More than one dangerously sick child has failed to recover because the parents had never taught that child to do what was for his good whether he wanted to or not.

Your child with acute endocarditis or with a chronic valvular lesion has a serious complaint, to be sure, but other things than the mere illness itself affect the ultimate outcome. Chronic throat trouble and recurring though slight rheumatic attacks are likely to increase the heart difficulty. A cardiac disease in a child is, other things being

equal, fraught with more serious possibilities than would be the same defect in a responsible adult. Not only is the child exposed to greater chance of infections, as some of the so-called Diseases of Childhood, but his resistance is less and he is less apt to regard symptoms indicative of beginning loss of compensation.

And right here let this term compensation be defined, for doctors will often use it in speaking to you of your or your child's heart disease. The lesion is or is not compensated is an exceedingly common medical expression. A lesion signifies a defect no matter of what nature, whether a valvular one or a degeneration and dilatation of the heart muscle. By compensation is meant the adequate adjustment of the heart to the lesion and, therefore, its ability to perform its work satisfactorily in spite of the inherent or structural defect. Failing compensation signifies failing power on the part of the heart, while lost compensation or "decompensation" denotes complete failure on the part of the heart to propel the blood as well as it should or did previously, and this state is always more or less dangerous according to the degree of decompensation.

To know that the heart is enlarged seems to frighten some people even more than to be told there is a leak, for instance. And yet enlarge-

ment of the heart is indispensable in many cases to the establishment of adequate compensation. The seriousness of the enlargement depends on the nature or kind of enlargement. For instance, when there is a decided leak, say of the valve intended to keep blood from flowing back into the left ventricle after its expulsion into the arteries, it can only be made good, that is, compensated by hypertrophy on the part of the wall of the left ventricle. This hypertrophy or increased thickness of the muscle serves to protect the ventricle from stretching to a point that would weaken it. Whereas, were the enlargement to consist in dilatation without hypertrophy this would utterly cripple the heart and make it cease to expel its contents altogether.

Therefore, when you ask if a valvular lesion is serious you must understand that the answer depends in part at least on the degree of enlargement and the kind of enlargement.

On the other hand, the absence of determinable enlargement in any case of valvular disease is a very good sign and other things being equal, lessens its seriousness. In this latter case the absence of appreciable hypertrophy is held to indicate a not very pronounced leak or narrowing, as the case may be. While in the former instance a well compensating hypertrophy denotes that the

muscle has escaped serious injury even though the valve has been extensively damaged. In brief, the seriousness of a valve defect depends not so much on the presence of the defect as on the ability of the organ to make amends for the defect by the integrity of the muscle or wall on whose efficient working circulation depends.

Suppose you have broken your wrist. You would call that serious, would you not? And yet its real seriousness depends not so much on the fact of the fracture as on how well the broken bones are able to unite and thus render the hand and arm again useful. So, to repeat, is it, with a disease of this vital pump of ours. The injury resulting from the endocarditis or pericarditis is an injury, but it may not prove irreparable.

Also the fracture of your wrist will prove serious oftentimes in direct proportion to the time allowed for its healing and on the care with which the wrist is used after union of the bones has taken place. In the same way with the injured heart. The length of time allowed for the inflamed valve or muscle to heal and adjust itself to altered conditions has much to do with the degree of seriousness likely to result. Furthermore, the way the heart is used after all inflammation has subsided has very, very much to do with determining this question of seriousness. It



is on this account that a valvular lesion in a child is more apt to prove serious than in an adult who presumably has more judgment and can control his impulses better.

If by asking about the seriousness of a heart disease in your child you mean is there great danger of the child dropping dead unexpectedly, you may take to your heart the comforting assurance that this is most unlikely so long as compensation is preserved and indications of impending failure on the part of the heart are not ignored. For this reason it is prudent to have your child taken to your physician from time to time for a careful inspection of his machinery. And finally, do not neglect what seem to you trivial illnesses, for they may be the beginning of more serious damage to his already injured but compensated heart.

There is still one more consideration with regard to the seriousness of a valvular lesion that must be mentioned. This is the well established fact that a stenosis, or narrowing, is less favourable as respects length of life and freedom from troublesome symptoms than is a leak or regurgitation. Young children rarely show pronounced stenosis of an opening, as of the mitral orifice, and for the reason that the changes which bring about a narrowing are of slow growth. There-



fore, the greater seriousness of a stenosis should be realised by adults and particularly by women since mitral stenosis is a very frequent form of valvular disease among them. Its greater gravity is owing to the fact that a narrowed or constricted orifice presents a constant impediment to the free passage of the blood stream. Whereas, in the case of a leak the back pressure takes place only at the instant of the regurgitation and the chamber out of which the blood leaks finds no obstruction to its free emptying. But here again the gravity of a stenosis depends on the degree of the narrowing, and this is shown by the amount of enlargement and the ease with which you feel the consequences of exercise or other influences that demand increased work on the part of the heart. Within certain limits, therefore, you yourself have to do with the seriousness of your heart defect, as will be shown in a subsequent chapter.

And now with respect to weakness or degeneration of the heart muscle, seen in elderly people chiefly. From what has been said repeatedly concerning the importance of a good heart wall you should need no statement here that disease of the myocardium, or cardiac muscle, is serious. It is a condition with which you can not play fast and loose, but one demanding respectful atten-

tion and protection. A weakened heart wall can be easily overstrained, and if you persist in making unreasonable demands on it the time is not far distant when it is going to protest in a way you will find most disconcerting.

A man of sixty-two whose arteries had grown so stiff and resisting as to cause his heart to enlarge in its faithful endeavour to perform its augmented labour was ignorant of the danger confronting him. So he spent last summer in working on a newly purchased farm. It was work to which he was unaccustomed and without realising it he strained his already overburdened heart. Late in the Fall he attempted to carry home from his office, not a great distance, a box weighing about thirty pounds. To him this seemed an insignificant weight, and yet before he reached home he became greatly out of breath. From that time forward his condition grew steadily worse and at length he was in the care of his family doctor and in so desperate a state that recovery was exceedingly doubtful. This instance is cited to illustrate the seriousness of disease of the heart muscle and at the same time the folly of going on year after year without knowing just what reserves one has.

Many men who have been active all their lives and who may not have been laid up with sick-

ness of one kind or another do not like to face the fact that having passed middle age they are no longer kids. They may have had a warning by their doctor or from some rather unpleasant feeling in their chest, but they choose to ignore the possibility of anything serious being the matter with their machinery. So they run for a train, play tennis or do some other unwise thing at their age.

A veteran of the Civil War when well on toward sixty years of age, but still hale and hearty as he thought, climbed a mountain in California with the result that he dilated his heart. He lived for nearly or quite twenty years thereafter, but at the cost of incessant care of his damaged pump. Had he been apprised of the gravity of overstraining his heart at middle age he might have been spared much discomfort and uneasiness of mind.

Another man who has a degenerated heart muscle with consequent leak of the mitral valve takes such excellent care of himself that he experiences no symptoms indicative of failing circulation. Yet he often inquires if his condition is serious. Of course it is serious and so is the state of anybody, man or woman, whose heart walls are not perfectly sound. If this applies to you, you do not need to get into a blue funk and give up.

Take an inventory of your stock, so to speak, ascertain how much reserve capital you have and do not go beyond it. With care and not worry, useless worry, you may live out the allotted span of life. Remain in ignorance and fancied security, and you may exhaust your heart's reserve of strength and have to pay the cost by retirement from business or enforced semi-invalidism.

Perhaps you have been told your blood pressure is too high. In case you have, you probably appreciate it is no trifling matter, but bear in mind that even with abnormally high arterial tension its degree of gravity depends a good deal on how you take it. If you adhere faithfully to the rules laid down by your physician, you may keep it down within comparatively safe limits. Paddle your own canoe regardless of rapids ahead and you will wreck your craft inevitably and much sooner than will be necessary.

To be informed that the state of your heart, blood vessels or kidneys is serious does not mean necessarily that you are going to die soon. It does not need to make you self-centred or a hypochondriac. It means only that the part of your machinery showing wear requires extra attention. The human heart is a truly wonderful piece of construction that often goes on pumping well enough for all practical purposes, even when

## 180 Your Heart and How to Take Care of It

---

there is noisy friction somewhere, provided it is given half a chance. And the giving it this half chance may consist in acknowledging there is a serious defect and facing the truth like a man.

## CHAPTER XII—*Continued*

### CAN IT BE CURED?

**A**NOTHER question not infrequently put to the physician who has just reported the detection of a valvular lesion or other defect is "Doctor, can it be cured?" A definite reply can not always be given, but as a general proposition it may be stated that a cure can not be had, if by cure is meant a return to the state the organ was in before it sustained any damage at all. A relative cure is often possible, but a structural defect excludes all thought of the injured heart being put back into as perfect a condition as it was before.

Valves that have been made stiff and distorted by inflammation can not become smooth and velvety soft as in perfect health. A heart wall that has become thicker than normal can not be made thinner again, and if it could, it would only be the weaker and more incompetent to do its allotted task. Arteries that have become like crooked wires strung with beads can not be rendered smooth and straight and elastic by any



amount or kind of treatment. Kidneys that have suffered the changes found in Bright's Disease can not be transformed into normal organs. These are facts, disagreeable facts, and yet the disease, or rather the consequences of the disease, may not be so bad as you may suppose.

Take acute inflammation of the endocardium or of the enveloping sac, the pericardium. The infection responsible for the inflammation will in favourable cases subside and in so far a cure takes place. The damage sustained, however, remains. Still even here there is often room for hope. Now and then a person is seen whose history and heart examination prove he once had rheumatism of the heart. Yet so slight was the damage that one can say only a scar remains. Such instances are not common, but they do occur.

In still other cases a valve is left permanently and considerably defective. If in spite of this the heart regains good functioning strength and the patient in time feels no ill effect but is equal to any reasonable requirement, his heart disease has been cured in a relative or comparative sense.

This, if you are a parent of a child with some form of heart disease, you should understand clearly and you should find comfort in such knowledge. A broken leg may if well set and

united be restored to usefulness, and a damaged heart may in many cases be restored to such an excellent condition that it will last a lifetime and even permit of arduous labour of a physical sort.

There are conditions, however, that can not be cured even relatively and the heart must be nursed along by every art and skill known to the Medical Profession and by all the care the parent or nurse or the patient himself may be able to bestow.

As you know from what is said in the chapter on Infections, the endocarditis caused by the streptococcus viridans is one of the diseases that is rarely curable. Nevertheless, nature sometimes comes to the aid of patients with this affection in a way that lends hope in some cases even of this formidable complaint. "Hope springs eternal in the human breast" and there is no desire or intention to take hope away from you as regards yourself or your dear one. But in asking if the heart disease can be cured do not allow yourself to expect too much and do not be cast down if the doctor seems to take too pessimistic a view of the case. So long as there is life there is hope, and physicians know that the behaviour even of a desperately sick heart may furnish many surprises. Patients have gotten well or at least comparatively well when they seemed to have almost no chance of pulling through.

The aim of this chapter is to make you understand that the word cure applies to many persons in a comparative sense and that a damaged heart is not of necessity a useless heart.

A well-known attorney of Chicago was found over thirty years ago at the age of fifteen to have a leakage of his mitral valve. Yet he went through college successfully and to-day is carrying on an extensive law practice. Other persons have lived to the age of seventy years with a valvular disease acquired in early life. Such instances as these should encourage you, but they must not make you reckless.

When it comes to such diseases as angina pectoris, fatty degeneration of the heart muscle, syphilitic disease of the aorta or heart wall, there can be no hope of a cure in the sense of a restoration to former health, but even in such cases a relative recovery may be achieved by long continued, persistent treatment and strict obedience to every detail laid down by the medical adviser.

Being forewarned is being forearmed and if you face these facts like a thoroughbred, that is, with the determination to do your utmost in the fight confronting you and to go down to defeat, if that is inevitable, with a determined spirit, you will do much oftentimes to win the struggle or at least to postpone the inevitable. To whimper

does no good and only robs you of courage. If your dear one has an incurable form of heart complaint, keep up a brave exterior and sustain him by your smile and words of cheer. And added to this, help him to follow obediently all the rules given by the doctor or that are in accordance with good sense and judgment. The assistance rendered by a wise mother, wife or sister is often the thing that turns the scale in favour of the sufferer. In a succeeding chapter will be found suggestions how you may preserve the integrity of your own damaged heart and assist your child or other dear one to do the same.

## CHAPTER XIII

### HOW TO TAKE CARE OF THE HEART

**I**F this chapter seems to repeat much of what has been said before, your indulgence is requested on the ground that reiteration often serves a useful purpose as well as because it is unavoidable.

Let us start with the care of a child or other person with acute inflammation of the lining membrane of the heart. What would seem to you to be the sort of care most likely to promote the least possible damage? Would it not be to keep the heart as quiet as can be done? Undoubtedly, and yet mothers and nurses appear oftentimes not to realise how little it takes to accelerate the action of the heart of a young child and especially if the heart is inflamed. The more rapidly the heart beats the greater is the strain put upon the valves and particularly the valve feeling the brunt of the infection. Moreover, the faster the heart beats the greater the likelihood of its wall becoming dilated and seriously weakened by being de-

prived of much of the time needed for its rest and recuperation.

These are some of the considerations which make it indispensable that the child be confined strictly to bed and so far as difficulty of breathing allows, kept lying down. It may be that the little sufferer is so weak and ill as not to feel like doing anything else than lie down and keep quiet. And right here let it be said the patient endurance and absence of complaint on the part of some sick children is most pathetic. In some other cases, on the contrary, the child is fretful and cries at the least restraint or attempt to administer necessary medicines. In which do you think the chance of recovery is the greater, assuming the heart equally inflamed? Naturally, in the one who is docile and tractable.

Therefore, do what you can by firmness and gentleness to keep your child from being irritated and excited, particularly if he is of a "nervous temperament." Amuse him with such toys and such stories as will keep him quiet in mind and body. Do not let other children, brothers, sisters or playmates, vex or excite and tire him by too lengthy visits or tales of the good times they are having while he is confined to bed. And equally or even more important, in some instances, is it to make the little invalid understand



he must take his medicine without struggling and must try his utmost to take the food and fluids even if appetite is wanting.

You may exclaim, "Why on earth is ne narping on this theme? Does he think we parents haven't Common sense?" Not many weeks ago a girl of ten years was seen who was having an intense and serious inflammation of all the heart structures and perfect rest of both mind and body was imperative. Yet that girl, partly on account of her disposition but mainly because of having never been taught to obey and subordinate her will to the inevitable, was most difficult to manage. She made a fuss every time she was asked to take medicine and would throw herself about in a truly disquieting fashion. The result was that she had to be kept quiet by means of powerful sedatives, and this is not desirable, as you can comprehend.

Then after all active symptoms, such as fever and rapid heart action, have disappeared, do not be impatient at still further restraint of the child's activities. Remember that the longer the child is kept quiet, even confined in bed, the better is the prospect of the heart recovering with a minimum of damage to its valves. It may be wise in some instances to insist on absolute

---

rest for several months after the child seems well enough to get about.

This enforced inaction after the child or adult seems well is often thought a great hardship and a refinement of caution, but the physician who keeps the future of his patient in mind as against his present desires will prove in the long run to be a real benefactor.

This was illustrated once in the case of a young man whose condition at the time he was seen seemed truly desperate. But he was in the hand of a sensible family doctor who appreciated the value and benefit of long continued rest in such cases. This wise physician told subsequently that he kept that young man in bed for nine months and with the result that he was finally able to get about with a tolerably useful heart. The sad part of this tale is, however, that this patient several years later succumbed to a streptococcus viridans endocarditis. This instance emphasises two great lessons in the care of the inflamed heart: namely, the truly surprising attainment of good compensation when sufficient time is afforded by wise management, and the necessity of looking out for and of the removal of any focus of chronic infection which hides the dangerous streptococcus.

And now what is to be the management of the patient when at length exercise is permissible. In

the case of your child do not let him at once begin to play and romp, but teach him, if old enough to understand why, that he is to avoid running, wrestling or scuffling and to go upstairs slowly, assuring him that if he is obedient now he will in time probably be able to play and live like his brothers or comrades. Such prudence and restraint as this does not mean that he will become a Mollycoddle and Good-for-nothing, but only that he may preserve his heart from greater harm.

The same rules of conduct apply to grownups as to children. Indeed, it is not very uncommon to find patients of presumably years of discretion who are harder to manage than are those scarcely out of infancy. They are so wilful and so spoiled that they resent any sort of restraint, even when told it is for their good. They show it particularly in the matter of enforced rest. Because not actually suffering pain or other symptoms to remind them of their hearts, they fret and fume, nay! worse, actually refuse to obey the doctor or nurse who is restraining the patient out of no spirit of arbitrariness but solely for the purpose of securing the best results possible.

Therefore, if by any chance this picture applies to you, curb your impatience and longing to get up with the reflection that this long and tiresome period of rest is essential to give your hard-

worked, faithful heart ample time to get over its inflammation.

If you had a broken leg and it hurt you to step on it, you would give it all the time required to put it in such a state that you again might use it without discomfort. Why not then give your heart the same treatment? A celebrated Swiss physician once reported the instance of a man who would not go to bed and thus permit his dilated, feeble heart to regain compensation. At length, however, he had the misfortune, as he thought, but in reality the good fortune, to break his leg. This obliged him to stay in bed at complete rest for several weeks, and with the result that not only did his fractured leg unite well but his heart got the rest it needed and had been refused previously.

Friends as well as the patient sometimes inquire if the prolonged rest will not weaken them and so do more harm than good. Well! Suppose it does weaken the muscles of your legs! Is that of as much consequence as the weakness of the muscles of your heart likely to follow resumption of walking before the organ is ready for it? Besides, the weakness of the body muscles can be recovered from comparatively quickly, whereas weakness of your heart wall may never be recovered from. Furthermore, the very weak-

ness you fear on quitting your bed may prove an additional safeguard to your cardiac pump by compelling such slow and careful movements at first that they can not possibly put harmful strain on your recently and perhaps still inflamed heart valves and heart wall. Be content to make haste slowly, remembering that the race was not won by the nimble-footed hare but by the slow-going tortoise. This fable has a deal of truth in it and is particularly applicable to persons convalescing from so serious an illness as a rheumatic inflammation of the heart.

Perhaps you think such caution and care are going to make you introspective and permanently afraid of overstraining your heart when finally the physician assures you that compensation has been gained and it is safe to resume your former mode of life. It will not do so if you determine not to become self-centred but will try, no! if you will not let yourself dwell on and study your sensations. It is very easy for one to get into the habit of studying his feelings, particularly, if he has a pump that has to be used carefully, but if you do not feel your own pulse and do not insist on knowing its rate, your temperature, and, in short, every record the nurse or doctor puts down, you will do much to remain a sensible, even-minded individual. Tackle the job of get-



ting well with as much good judgment and determination as you would any business proposition or any task requiring a clear head and an indomitable will.

Now let us turn our attention to the care of chronic heart troubles, which include long-standing valvular lesions and the insidiously developing diseases of the muscle or wall of the heart and, of course, hardening of the blood vessels with or without abnormally high blood pressure. Persons whose rheumatism of the heart occurred many years in the past often have no positive knowledge as to whether their hearts were damaged at that time or not, while others knowing one of their valves leaks, for instance, go on living as strenuously or recklessly as if nothing had ever ailed them.

If you happen to be one of these individuals you will make a mistake if you do not consult your doctor and find out just where you stand. In the event that your heart is pronounced perfectly sound, your mind will be set at rest and you may get some advice that will be of service to you. But if, on the other hand, you are informed that a set of valves did not escape, the knowledge may enable you to avoid habits and ways likely to impair the strength of your heart at some later period.



Assuming this latter to be the state of your heart, it should concern you to peruse attentively what is now to be said. If you have read and profited by what has been reiterated in preceding pages concerning the risk of infections, there is no need of repeating here the admonitions stated so strongly in the chapter on Infections and if you are wise you will heed those injunctions.

**EXERCISE.** In all probability the thing that interests you most and even more than the danger of sore throats or other presumably petty indispositions is the matter of how much exercise you can take and of what kind. In the first place let it be said, a perfectly compensating heart is often able to endure exercise that is quite violent provided certain rules are observed as follows:

(1) If you have *mitral stenosis* you must not run, hurry upstairs, play tennis or do other things that cause your heart to beat uncomfortably or put you distinctly out of breath. Remember that the blood can not pass through the narrowed mitral opening as rapidly as it flows to the heart and hence the stenosis acts like a dam across a river. So that if the blood stream reaches but can not flow through, it will tend to flood the lungs and parts behind, the same as will the river. Therefore, you with narrowing of your mitral valve must consider shortness of breath on exer-

cise as a distinct warning on the part of your heart, that it is being over-strained.

(2) If you have some other form of *valvular disease* so well compensated that it permits even strenuous physical effort without more breathlessness than would be normal to anybody, you still will do well not to presume on it for too long a time or only spasmodically. Occasional hard exercise acts in the case of the heart muscle the same as with the muscles of your legs or arms; it will tire the heart more easily because it is not accustomed to the effort. Regular moderate exercise will train the cardiac muscle in the same manner as it does muscles in other parts of the body.

(3) SHORT BURSTS OF SPEED may do you no harm, whereas a mile run across country, for example, might injure your heart even if it be well compensated.

(4) Be careful about SWIMMING. It may do you no harm to swim for short distances and if you do not stay too long in the water. In swimming you not only propel your body through the water but you have to overcome the weight and resistance of the water which in reality opposes greater resistance than does the atmosphere.

It is not infrequent to read of some expert swimmer who was drowned presumably because

of a cramp. In reality the cause of death is heart failure and the failure of the heart is due to paralysis of the capillaries or minute blood vessels communicating between the arteries and veins. The indication of impending paralysis of these hairlike vessels is seen in the blueness of lips, fingers and lastly of the entire surface of the body. When such extensive dilatation of capillaries takes place it practically stops the flow of blood in them and the heart is forced to pump the harder to keep up the circulation. Therefore, as you can readily comprehend, it is particularly hazardous for one with any form of heart disease to linger in the water after blueness of the skin appears. Finally it is entirely comprehensible that it may be dangerous in some cases to plunge into cold water, as in diving. The sudden shock might prove too much for a weakened heart. A cold sponge bath in the morning may be all right if you react well and quickly and your heart is tolerably strong, but if its muscle is degenerated or dilated, a cold tub may be quite inadvisable.

(5) Be extremely careful about CARRYING A HEAVY WEIGHT as a trunk or especially a heavy suitcase. Although it is well known that some men with even a valvular heart trouble have been known to follow laborious occupations that required the handling of bags of grain, heavily

loaded boxes, etc., still the caution given above is not out of place. It is particularly straining to the heart to carry weighty packages upstairs or to swing them onto your shoulder, for either of these efforts necessitates stiffening of the chest muscles in a way to interfere with easy respiration and the strain put upon the lungs reacts badly on the right side of the heart.

Any strong muscular effort that has to be put forth while the chest is fixed or when the attitude of the body is such as to make the exertion doubly hard is bad. Thus men have been known to try their weak hearts severely by shaking down a furnace, as must be done when one is stooping, or by lifting and dumping a heavy bucket of coal into the furnace. So that, after all, the effect of physical exertion depends a good deal on how it is done.

(6) If you notice an inclination to breathlessness ON WALKING be careful not to talk steadily while walking or ascending stairs. Easy respiratory play of the lungs is essential to perfect circulation into and out of the heart. When you talk you have to fill your lungs and then force air out through the vocal cords while you hold your breath. It is on this account that almost any person with a weak heart and more or less shortness of wind in walking will tell you that

he finds his difficulty greatly increased if he talks and walks at the same time.

(7) GO EASY AGAINST A STRONG HEAD WIND or when having to plough your way through a deep snow. In making your way in the face of a head wind you are pushing as well as walking, and if you have a weak heart you will find it tells on your wind to push anything. It was wading through deep snow in the face of a great blizzard that cost Senator Conkling his life. His weak heart muscle simply could not stand that amount of exertion and so gave over the struggle.

(8) SINGING is something about which the doctor is often asked. There can be no objection to singing if the heart is well compensated, but if the right heart is over-burdened as in mitral stenosis or a not well compensated mitral regurgitation, then prolonged singing, like much laughing, may overstrain it, for both acts have to be performed while the breath is being held and strong expiratory pressure is being made.

(9) ROWING A BOAT OR PADDLING A CANOE is not apt to prove injurious if it is performed easily and not against a strong head wind and heavy sea. Under adverse circumstances such efforts as these may be extremely strenuous and then harm might result.



(10) GOLF is usually admissible even for elderly men with weakened hearts, but for them it is best to play on an easy course where hill climbing is not necessary or is not difficult. FOOTBALL, on the other hand, is altogether too strenuous for youths with damaged valves, for, as you know, heart strain is not uncommon among athletes. However, it is likely that the young man with a poor pumping apparatus will be barred from college athletics by the Physical Director. TENNIS, BASKET BALL and other sports must be judged of largely by the effect you notice and by the excellence of your compensation.

(11) MOUNTAIN CLIMBING is dangerous for you if you are elderly or have stiff arteries and particularly if you are inexperienced and unaccustomed to the uphill exertion and rarefied air. The altitude in itself is not usually bad and more than one person with a seriously defective heart has travelled across the continent to or from California. It is exercise at a high altitude that puts strain on your heart, for at such heights the action of the heart is more than usually rapid and the play of the lungs is increased. Moreover, in mountainous localities the country is rarely level and there is more or less climbing to do. Therefore, if duty calls you to an unaccustomed altitude, remain quiet on reaching there until you



have become acclimated as it were. A man of middle age but robust physique ruined his heart by carrying his heavy grip in Denver at an unwonted altitude of a mile.

(12) DANCING is something the doctor is sure to be asked about, especially by young women, although there are elderly individuals who find much enjoyment in it. You may dance if you do it in moderation and sit down to rest so soon as you notice uncomfortable shortness of breath or pounding of your heart.

(13) DRIVING AN AUTOMOBILE. This is another subject for inquiry on the part of persons, both young and old, whose hearts are no longer quite sound. To this, as to other queries, the reply must be conditional. If driving a motor keeps you on tension so that the action of your heart is unduly rapid, seems to be up in your throat, as it were, or if your car is heavy and you have to exert a good deal of strength to guide it over rough roads, then it possesses possibilities for harm. But more dangerous than the guiding of the machine is *cranking it*. Some cars crank hard and much muscular strength is necessary to start the engine. Under such circumstances you will be very apt to strain your heart seriously. More than one man has traced the beginning of his breathlessness and even irregular

beating of his heart to prolonged cranking when the engine was cold or unusually difficult to start. Therefore, beware of this unwonted exertion if you have any doubt as to the integrity of your heart muscle.

(14) HORSEBACK RIDING does not generally subject the heart to strain, but if you ride a hard-mouthed animal and have to do much pulling on the reins, it can over-strain your right ventricle, or if your mount is so skittish as to keep your pulses pounding with apprehension, then do not ride far or often; or exchange your steed for one of a gentler and more certain disposition. On the whole, equestrian exercise is permissible unless your heart is very weak.

(15) SKATING, particularly roller skating, is a pastime much indulged in by children, although now and then a man of middle age enjoys the sport on ice. As for you, if an adult, you must decide the question in accordance with conditions of weather and what effect you perceive on your wind and heart action. If it puts you out of breath you should not skate, but if you skate easily and notice only a feeling of well-being afterward, then the sport is permissible. Children are apt to disregard shortness of breath or rapid, even irregular, heart action when in the enjoyment of some favourite game or sport. Consequently, if

your boy has a valvular lesion do not permit him to skate as much and hard as he pleases, for he is likely to keep it up until almost exhausted or he comes in completely out of wind and with his heart going like a triphammer. We can not deprive children of all pleasure and it would be cruel if we could; so permit the boy or girl to skate and play if only they will promise to be moderate in it, that is, will stop short of becoming totally played out.

(16) COASTING is a delightful Winter sport which can be objectionable mainly on the ground of the hill climbing it necessitates and the drawing of the sled uphill. Whether or not it is to be permitted to a youngster who has recovered from rheumatism of the heart must be decided by the state of the pump and by the symptoms your boy or girl displays immediately following the exercise. If your child comes in utterly out of breath with either a pale exhausted looking countenance or with blueness of the lips and with his heart throbbing as if it would jump out of his chest, then the exercise is too much and must be forbidden. As with everything else, each case must be governed by itself.

Finally, as to the matter of exercise at all for persons with poor hearts: It is a very common notion that physical exercise is indispensable to

good health even when it is plainly too much for the heart. Consequently, old men with inadequate hearts will sometimes persist in walking, although showing by their breathlessness that it is too much for them. For instance, a man of seventy-five whose dyspnœa rendered walking very difficult persisted in it, notwithstanding, because, as he said, he thought the exercise would harden his muscles. The consequence was that at the end of several months he broke down completely and had to be put to bed. When at length his family doctor sought consultation in the case the exhausted heart was greatly dilated and irregular, and dizziness made moving about the room almost impossible. Six hours later this overworked heart ceased its struggle altogether and the man died suddenly.

As a matter of fact, exercise, even walking, is harmful and not beneficial to any one whose heart muscle is unequal to the effort. If you find walking causes uncomfortable breathlessness and a feeling of exhaustion and, above all, if it causes the sense of tightness and perhaps pain of angina pectoris, you would far better refrain from the exercise, no matter how much you think you need the fresh air.

The benefit from exercise comes from improved circulation and a better oxygenation of the blood

and tissues. But if the vital pump of life can not keep up the more rapid strokes required, then congestions in lungs, liver, kidneys and venous system generally are the result, and harm, not benefit, ensues. If you do your walking slowly and when the stomach is empty, that is before, not soon after, meals, you may do yourself but slight harm or possibly none at all, but you must observe great caution and must desist entirely if you find, by increasing shortness of breath and by the uncomfortable pounding of your heart, that the exercise grows more, rather than less, difficult.

No benefit can possibly accrue from over-driving your machinery. On the contrary, you with weak hearts will feel the better and stronger if you give your pumping apparatus no more work than it can handle easily and comfortably.

Semi-invalids sometimes resort to Osteopathy, massage or allied methods of obtaining exercise. Before adopting such modes of treatment you should get the advice of your doctor, that he may determine how much of such manipulation of your muscles is advisable. Do not leave the decision to your own desires or the recommendation of a friend, for harm has been known to follow such ill-advised modes of treatment. Passive exercises may be suitable to some cases, but judgment is requisite to the proper selection of the cases and

hence the decision of a physician should determine the question.

If the patient is too feeble to venture on pedestrian exercise, fresh air may be obtained in a wheel chair, carriage or carefully driven automobile and may prove of benefit both to the body and spirits of the invalid. Prolonged confinement indoors grows irksome and depressing, and when this is the case harmless diversion is beneficial, but you and your friends must always bear in mind that whatever gives evidence of overworking the enfeebled heart, is detrimental and should be abandoned.



## CHAPTER XIV

### THE CARE OF THE HEART—*Continued*

**O**CCUPATIONS. In this work-a-day world the question often arises not only in the minds of parents but also in those of ambitious young men and women, "What can I do with my damaged heart to support myself?" "What sort of profession or business should my son take up and should my daughter with her heart trouble attempt to do any work at all?" These are often very puzzling questions and must be answered not only in accordance with general principles but also on the merits of each individual case. It seems best to consider the subject in connection with the usual valvular lesions for their limitations are somewhat different.

**MITRAL STENOSIS.** This disease, being far more frequent in girls than boys, is the one we have to consider in connection with women's work. Even in comparatively minor degrees of the lesion, breathlessness on exertion, particularly on rapid walking and stair climbing, is a marked symptom. Therefore, it calls for occupations requiring very

little active running about. Stenography, typewriting, bookkeeping, telegraphy, cashiership, social secretaryship, operating a switchboard in an office and, in short, any work that permits desk-work is suitable, whereas the duties of a housemaid or waitress are inadmissible. A certain music teacher finds the walking from house to house more than she can endure, whereas were her instruction on the piano confined to a studio, she would be quite equal to it. A girl with mitral stenosis might very easily do millinery, dressmaking or other forms of needlework and in a word fill practically any position that permits sitting and working with the head and hands rather than with the feet, since in most instances it is physical activity, and not head work, that is objectionable. She might become a school teacher or governess, provided there would not be much stair-climbing, but she could not be a nursery maid since pushing a baby carriage and walking with her charge would be out of the question. Mitral stenosis, unless of a very pronounced degree, would not interfere with the study of Law or Medicine, but in the latter profession it would restrict one to office consultations instead of general practice. Of course, in fulfilling the duties of any position requiring long trips to and from the place of work, the distance to be travelled on

foot as well as the exposure to inclement weather would have to be considered. Persons with this lesion have more or less chronic congestion of the air tubes and on this account are particularly susceptible to colds and consequent cough with its pernicious effect on the right ventricle.

**MITRAL REGURGITATION.** Other things being equal, this is regarded the most favourable of all valve lesions and, therefore, handicaps an individual the least. Although by no means limited to the male sex, it occurs more frequently among young men than young women. Many persons with perfectly compensated leakage of their mitral valves are filling places of responsibility and even such as require manual toil. They are found among porters, delivery clerks, guards on surface or elevated railways and, indeed, in almost any of the vocations filled by men. The question with respect to employment is, therefore, concerned with the efficiency of the cardiac muscle rather than the nature of the work. Nevertheless, in choosing your life work or in helping another to select his vocation, preference should be given to such as do not necessitate severe manual labour or the ascent of innumerable stairways as has to be done by a collector or the superintendent of construction of high buildings. This latter job is often bad for men of middle age whose hearts

have begun to feel the wear and tear to which they have been subjected. Several such instances have come under observation. But to return to the subject of a choice of vocation for young men and women with mitral regurgitation. Professions of all kinds and most trades can be adopted if no temperamental obstacle exists and if the individual is equal to the ordinary ways and pleasures of his fellows without consciousness of his heart. It goes without saying, however, that in arriving at a decision you should give preference to occupations that offer few chances of heart strain.

**AORTIC REGURGITATION.** This lesion is next in order to a mitral leak as regards the ability to engage in active physical pursuits. When perfectly compensated by good hypertrophy of the left ventricle it may not occasion any symptoms whatever. It rarely produces shortness of breath but may make its presence known by rapidity and strength of the heart beat against the chest wall. It is not likely to remain latent, as it were, for so long a time as is mitral regurgitation, and on that account perhaps it might sooner yield to the strain of manual labour of a severe kind. A butcher with this lesion is only now, at forty-three, beginning to notice shortness of breath. Clerkships of all kinds, professions and

the lighter trades are open to persons with a leaking aortic valve. There can be no objection to mercantile pursuits, but farm work, unless of the lighter sort, might prove hazardous. Truck gardening would seem suitable to almost any form of valvular disease when this is not extreme and the general health is good.

AORTIC STENOSIS, the last of the usual valve defects to be here discussed, is so rare as almost to warrant our leaving it out of consideration. But since it is sometimes found in association with regurgitation at the same orifice and then renders protracted compensation unlikely, a few words on the subject may not be out of place. Dyspnœa of effort is not so easily induced as in mitral stenosis, but inasmuch as heart power can not be easily re-established, if at all, when once broken down, the same restrictions as to occupations may apply as in cases of mitral narrowing. Indoor occupations should be chosen that do not entail severe physical efforts, and those avoided that require the lifting and handling of heavy boxes, trunks, rolls of cloths, etc.

In having attempted to lay down rules for your guidance in selecting an occupation for yourself or for your son or daughter with a heart damaged by rheumatism, it has been difficult to state hard and fast rules. For, as said before, each



case must be studied by itself and often other factors must be taken into account than merely the state of the heart. The general physique, the state of the nervous system, the temperament, excitability, self-control and judgment, the ease with which fatigue is induced, these and other factors should receive due attention. Therefore, the physician alone can not decide this momentous question; he can only counsel and advise and point out the probable effect on the heart of the various factors at work in any given case.

**MARRIAGE.** The doctor is often asked by parents if their daughter with heart disease should get married. As with practically every other inquiry, the answer has to be a relative one. There are some cases in which, notwithstanding absence of symptoms at the time, the enlargement of the heart is so pronounced as to render child-bearing extremely hazardous, and yet there are innumerable instances of mothers with decided valvular lesions who went through their confinements without unusual difficulty. As might be anticipated from what has been said concerning the relation of mitral stenosis to occupational influences, this defect is the one least likely to endure pregnancy and labour without injury.

The effect of child-bearing should be clearly stated to ladies with narrowing of their mitral



valve. The watchful care of a competent obstetrician should be deemed indispensable during the latter months of pregnancy and the family as well as the patient should be warned of the possible need of a termination of the pregnancy when symptoms of danger to the young wife develop. Resort to such extreme measures should not be had, however, until the benefit of strict bodily rest has been tested, for happily this treatment enables some women with serious heart trouble to weather the storm successfully.

Finally, there is in some mothers real danger of over-straining their hearts by lifting and carrying about heavy babies and young children, especially when this is added to the cares of nursing and housekeeping. If fully warned of these risks, the sensible young mother can avoid them and thus guard her weak heart.

VARIOUS CONSIDERATIONS APPLICABLE TO ALL FORMS OF HEART TROUBLE. The subjects thus far discussed concern particularly persons who bear the scars of rheumatic attacks which have left them handicapped but not wholly out of the running. Now it is time to devote attention to those circulatory impairments encountered in persons who have come to the meridian of life or are journeying toward its sunset.

Some of you are aware already that your ma-

chinery is showing undue evidence of wear in your pump, your tubes or your waste-pipes, the kidneys. Others of you are still in ignorance of your real condition and are living on in the belief that "Where ignorance is bliss, it is folly to be wise." You would not run your factory year after year without now and then having your steam engine examined. Then why trust to the soundness of your human machinery without occasional inspection? If a careful inspection of all its parts by your medical engineer, the doctor, assures you everything is all right, then you do not need to peruse these pages. But presumably some of you are directly concerned and for you this book is written.

It is reasonable to assume that most of you are showing moderate or pronounced elevation of blood pressure, for this change is astonishingly prevalent in individuals past forty years of age. Others of you show stiffening of your blood vessels with or without heightened arterial tension, while still others are undergoing insidious changes in heart muscle or kidneys or both. To all of you, therefore, these rules for guidance and these admonitions are applicable.

**DIET.** You think of your food probably as a means of satisfying hunger and you meet this want in the way that conforms with long estab-

lished habits or that appeals to your palate. You know little or nothing about the actual amount of nourishment your body requires or of the proper proportion of different food constituents. Consequently, unless you happen to be a vegetarian you very likely eat relatively too much meat, eggs, poultry, fish and other articles rich in nitrogen or, as physicians call it, *protein*. Some of you, on the other hand, are fond of sweets and the so-called carbohydrates represented by bread, potatoes and cereals generally. Others consume large quantities of butter, cream and other fats. Therefore, without going deeply or scientifically into the chemistry and physiology of food, let the following generalisations suffice.

*Protein* is a tissue-forming food and fills the requirements of persons who are using their muscles in hard work. *Carbohydrates*, particularly in the form of sugar, supply force or energy and hence in the training of athletes form, relatively to meat and the like, the kind of nourishment best calculated to give endurance. *Fats* also come under this head, while vegetables and fruits furnish, in addition to a certain amount of carbohydrates and protein, very necessary inorganic principles. They are laxative also and in that respect are highly useful.

Furthermore, the protein of our food, particu-

larly articles of animal origin, meat, fowl, etc., are said by Metchnikoff and dietitians to furnish the very sort of material on which the multitude of bacteria inhabiting the large bowel thrive and flourish, while properly cooked vegetables as well as fruits tend to deprive the intestinal micro-organisms of the material they enjoy.

The foregoing statements make it evident that the matter of diet is an important one for persons with outspoken heart trouble as well as those whose vessels are hardening and in particular for individuals with too high blood pressure. If you are young and have a valvular defect that prevents much exercise or causes undue breathlessness, then do not over-eat, for it is a fact well known to short-winded people that an over-loaded stomach increases their difficulty both by pressure upward of the full stomach against the lungs and heart, but also because a sluggish circulation in the digestive organs favours the formation of gas and consequent distention of the bowel. You do not need much meat, eggs and allied substances rich in nitrogen, because your lack of exercise does not allow your tissues to burn it up through increased absorption of oxygen. Carbohydrates will give you energy enough, and yet if you have a marked tendency to gas-formation, you should indulge sparingly in sweets. Lastly, it is a bad

habit to eat between meals, for unless your heart trouble is so well counterbalanced by compensating hypertrophy, there is enough congestion of the abdominal organs to make digestion and absorption slow. You may, like some individuals, feel a sensation of craving or gnawing in the stomach that makes you think you are hungry. As a matter of experience this feeling is found due not to want of food, (unless, of course, you have eaten practically nothing at the previous meal) but is caused by the presence of irritative acids resulting from decomposition of food. Allay it, therefore, by a draught of water rather than by taking milk or other foods you really do not need. If despite carefulness in diet you still have indigestion, consult your doctor.

**RULES OF DIET FOR PERSONS WITH HIGH BLOOD PRESSURE.** If you belong to this class you must cut down meats and other articles rich in nitrogen to a minimum or discard them altogether. This applies especially to beef, dark-colored game, as wild duck, etc., sweetbreads, kidneys, calves' brains, cheese, scallops and lobster. Take no broths or strong stock soups, for these contain certain principles that raise arterial tension. Subsist mainly on fruits, green vegetables, cream soups, milk or buttermilk, and a moderate allowance of bread and cereals. Remember that too



great a quantity is almost as bad as a wrong quality of your dietary. Partake very sparingly of coffee, tea and chocolate or cocoa, depending on water and fruit juices. Wines, beer and other alcoholic drinks are objectionable on several grounds and among these because they stimulate the appetite and thus tend to over-eating. So far as possible, let your food be coarse and laxative and free from articles that you find produce flatulence and constipation. You need, as a matter of fact, far less nourishment than you think you do or your appetite seems to indicate. But unless far too fleshy, do not limit your food allowance so greatly as to lose rapidly in weight and strength. If you are corpulent, give up sweets and most starchy food, but in attempting to reduce your weight have your regimen prescribed and your reduction-cure supervised by your physician. A too rapid loss in weight may become very injurious to your heart, particularly if at the same time you are resorting too zealously to physical exercise. This applies with peculiar emphasis to some of the courses of exercises advertised for reduction of obesity. Do not patronise the patent medicines vaunted for the same purpose. They are apt to contain thyroid extract or other drugs injurious to the heart muscle.

*If you are well advanced in years and senile*



*changes are showing in your heart and blood vessels*, your food should be light, simply cooked and easily digested. You are no longer growing and you probably are not so active as in younger days. Therefore, you require only enough nourishment to maintain your strength and weight. Butcher meat, eggs and strong soups you do not need and should take but seldom and then in small quantities. Milk foods and fruits, readily digested vegetables and light salads should form the major portion of your dietary. Eat sparingly and arise from the table feeling you could eat more, and yet do not starve yourself, for loss of flesh and strength is made up with difficulty by old people. Your digestive powers are feeble and your tendency to bloating after meals must be corrected by appropriate remedies, if necessary, and by taking your dinner at midday and making your evening meal a very light one. A very important reason for taking foods poor in nitrogen is the tax put on your kidneys in the excretion of urea and other substances resulting from the digestion of protein.

*Water.* It is really astonishing how little water is taken by the great mass of individuals. Because they are not thirsty they do not drink it, they say. Now you ought to realise, if you happen to be a poor water-drinker, that water is as

essential to the elimination of waste products from your body as it is in the flushing of the sewers of a city. You do not need to drown yourself with gallons of water, but you should take at least half a dozen glassfuls of good, drinkable water between meals in the course of a day. Drink moderately with your meals, depending on your saliva for the liquidation of your food, but give your kidneys and bowels the fluid they need between meals. And if your urine is scanty and acid try some of the table water that contains soda and other alkalies and see if they do not improve matters. Frequently this condition of the urine is attended with coldness of the hands and feet, and the drinking of soda water plain or of other alkaline waters will warm up the extremities in a gratifying manner.

*Attention to the bowel is so important* that this part of our subject can not be dismissed without a few words regarding it. Whether or not habitual constipation is a cause of hardening of the arteries and of early senile degeneration, it certainly contributes powerfully to increase of blood pressure or to its maintenance when it has set in. Therefore, correct this by all means! Do so by laxative foods and the daily use of mineral oil reinforced by the plentiful intake of water as recommended above. But more than this:

take a good cathartic occasionally, just how often can not be laid down here, but give yourself a thorough house-cleaning, as it were, and for you with stiff vessels or too high blood pressure it is well to make a yearly pilgrimage to some Health Resort where mild laxative waters can be had in connection with a carefully regulated diet, and proper hydropathic treatment.

*A warm bath in the morning*, and it may be a so-called Turkish bath, once or twice a week, are beneficial if you suffer from excessive pressure of blood and particularly if you have an early morning headache. If, however, your heart is weak, hot baths or prolonged immersion in quite warm water is not advisable and may do positive harm. It acts to produce a feeling of weakness and lassitude as does hot weather in Summer. However good a remedial measure it may be for some, do not resort to hot cabinet or electric light baths without first seeking the advice of your usual medical adviser.

**HABITS.** Under this head fall all those ways of doing work, seeking recreation and securing repose of mind and body that make up one's daily mode of life. We are an intense Nation and are apt to take our pleasures as strenuously as we do our work. Consequently, many of us incline to run our bodily machine altogether too fast

and too long. Persons with high blood pressure are like high pressure locomotives. They are capable of developing speed and energy and often pride themselves on their restless activity and almost exhaustless power for work. Such a man tears about as if his life depends on getting through with it in the shortest possible time. He is forever in a hurry.

If you are one of this kind, remember that ceaseless activity is at the expense of some part and, of course, the weak spot in your machinery. Perhaps you come of a family in which all members show a striking tendency to hardening of the arteries. As Sir William Osler has aptly expressed it, "There is poor rubber in their tubing." If you come of such stock, then your blood vessels are bound to feel the wear and tear of your unnecessary, restless energy, and if arterial hypertension is added to arterio-sclerosis, there is danger ahead. You are bound to hit a rock on the track or break a wheel and find yourself thrown from the track and sent to the repair shop or thrown onto the scrapheap. Slow down and give your engine a chance to cool off by taking a vacation whenever you find your body becoming jaded or your heart showing signs of over-work. The poisons produced by muscular or mental weariness (*fatigue toxins, as they are termed*)

are a potent factor in augmenting blood pressure, as proved by the diminution of arterial pressure that follows rest of mind and body.

If you are compelled to work at high pressure in office or factory and outside of your business have numerous demands on your head as well as heart, then try to let down after business hours and do not take your business to bed with you. When finding yourself jaded in mind and body, try to get away of an afternoon for golf or a spin in your motor. Do not attend frequent banquets where you are likely to consume more food and liquids than are good for you, besides smoking too many cigars. This is only an illustration of the way in which men of affairs are apt to over-stoke their engines and burn out their flues.

If you are a woman, do not try to manage all the social and club affairs of your town. You can not keep on the go all day and a good part of the nights without feeling the strain of it in some way and very likely in your circulatory apparatus. Many a society dame in our large cities shows only too plainly by the time she is nearing fifty that her heart muscle is getting weak and flabby from lack of sufficient rest as well as from intestinal toxins and want of proper muscular exercise.

If you are a young man or young woman with



a heart that has suffered from attacks by the streptococcus of rheumatism, do not push your heart to unnecessary work in pursuit of pleasure. It is perfectly natural that you should want something outside the daily monotonous grind, but remember that the truest enjoyment is found in moderate indulgence. You may take it as a good rule to follow that an unwonted sense of fatigue is an indication of heart fatigue and that exhaustion of the cardiac muscle may be brought on by want of sufficient rest as well as too severe physical exertion over a short period of time.

What has just been said to young people with defective hearts applies with even greater force to you old people who still pride yourselves on being as active as in earlier years. No matter how well you feel or how well preserved you may be, you are no longer young. Your resistance is diminished and your vital powers are easily exhausted. You may run for a hundred years or so, like the "one hoss shay," but if you do not look out, you will go to pieces unexpectedly in the same way. Make it a habit to lie down of an afternoon and rest, even if you do not sleep. Never neglect a cold or apparently trifling indisposition of any kind, for it may, as it were, "prove the last straw that breaks the camel's back."

Do not think that these various injunctions are



meant only for persons whose pumping apparatus is already showing signs of wear. They are intended as a guide, inadequate as it may be, for you to follow long before tokens of disease make their appearance. If you are living at too rapid a pace, moderate it before it is too late. You may be immune, or at least think you are, against the germs of disease, but you are not proof against the microbe of decay lurking in tireless energy and insatiable ambition. Curb your desire to be forever doing something and cultivate repose of mind and body, for you can not violate nature's laws without paying the penalty sooner or later. And when at last you do wake up to a realisation of that fact, you will wish some one had warned you in your youth or full maturity. Remember there are habits that are injurious although not vicious just as much as there are immoral habits that do harm. The effect of the former may not be so quickly or plainly apparent, but they become evident in the course of years.

**TOBACCO.** Something was said on this subject in the chapter dealing with disease of the heart at middle age, and it was there stated that it is not the use of tobacco that is harmful so much as it is its abuse and the manner of its use. Whether excessive smoking is or is not a potent factor in bringing about high blood pressure, it is very

common to obtain the admission by men showing stiff arteries and associated changes in the heart muscle with abnormal elevation of blood pressure, that they have been in the habit of smoking a dozen or more strong cigars daily. The smoking of anything like that number is an abuse of the weed, and you are earnestly urged to cut it down materially or give up the habit altogether if your vessels and heart are exhibiting signs of growing old before your years. It has been said with truth that we are as old as our blood vessels, and if at fifty or even younger your arteries begin to roll under the finger like a wire and increased arterial tension makes it feel resisting and hard, then you have got to look out and must mend your ways if you do not wish to be an old man long before you have reached threescore years and ten.

This statement is pertinent to some of you women, too, not because perhaps you are poisoning your blood and tissues with tobacco, but from several causes. Yet, as you know, cigarette smoking is on the increase among you members of the Fair Sex in this Country, and it is asserted by physicians who see the evil effects of the habit that women are peculiarly apt to go to excess in cigarettes and that it is more difficult to wean them from smoking than it is men.

You young men or women who have unsound hearts should be especially moderate in this matter and should not indulge at all if smoking quickens your heart beats or gives you a consciousness of palpitation. You certainly can not inhale the smoke with impunity.

ALCOHOL. What has been said in Chapter IX may well be reiterated here. Alcohol does your heart no good and is capable of doing it great harm. Do not drink gin in any form if you wish to save your kidneys, a warning that applies with special emphasis to all of you who have any form of heart or arterial disease, for the tendency of arterial or cardiac disease is to congest the kidneys and gin aggravates that tendency. Do not whip up your tired, over-worked heart by taking a "nightcap," for it robs the heart of much of its time for rest by preventing its slower rate of contractions during sleep. If you are feeling worn out by your day's work, do not irritate your liver by a cocktail or other form of liquor before lunch or dinner. It may give you an appetite and a false sense of refreshment, but you can accomplish the same thing by a short nap on reaching home. Sometimes a short, brisk walk even when you are tired and nervous from your confinement in office at high tension will, by supplying your tissues with oxygen, actually refresh

you and not add to your weariness. Under no circumstances permit yourself to drink to the point of distinct intoxication, for aside from any other reason it may produce positive exhaustion of a defective heart. These admonitions may seem superfluous to you, but are given because of the observation that young men with valve lesions are sometimes guilty of just such indiscretions. Finally, you who have too high blood pressure take liquor at your peril, peril of rupturing a blood vessel in the brain perhaps, but if not that, then of having it tempt you to over-eat and over-smoke.

**SEXUAL INDULGENCE.** Finally, duty compels a few important utterances concerning the influences of unbridled gratification of the sexual instinct. There can be no doubt of the baneful influence of excessive intercourse on a weak heart. Aside from the disastrous effects of venereal disease, of which syphilis is the chief, as stated in Chapter IX, there is real danger in unbridled carnal indulgence. Even the young may thus injure a defective heart, but a distinct warning should be given to the individual with high blood pressure and stiffened arteries. Instances are not rare of a cerebral hæmorrhage and apoplexy, and even of sudden death, during such indulgence. And, lastly, it should be said that serious conse-

quences have resulted from marriages between old men or men prematurely aged and young women. "A word to the wise is sufficient."

Surely if you have read carefully the pages of this little book you will have learned that your heart not only deserves but should receive protection not alone from infectious agencies without your body, but from irritating and stimulating influences originating within your own organism. We humans are so accustomed to abusing and misusing our various organs that we think nothing about it until the mistreated organ rebels and then we find it is too late to repair the mischief. The most we then can do is to conserve what working power there is left. How bitterly, alas! we then repent our misspent powers and with what anguish of spirit we strive to make amends. Therefore, let us strive to care for our hearts while we are still young or to reduce our speed of living and our indulgence in habits of all kinds that threaten our usefulness and our enjoyment in health of mind and body before it is too late. Hypochondriacs we do not need to be, but temperate beings we should be.

## CHAPTER XV

### THE USE OF REMEDIES

THERE is no intention of telling you in this chapter how to employ remedies or how to treat your heart when it needs special treatment. For such information you will have to go to your regular physician. The aim of this chapter is to overcome any prejudice you may chance to entertain with respect to the taking of such medicines as are known to exert a beneficial influence on a weak heart.

The one remedy *par excellence* in the treatment of cardiac affections is Foxglove or Digitalis, as it is generally called. Persons are sometimes prejudiced against taking this drug because they have read or been told it is a deadly poison or because they assume they are likely to become dependent upon it. Digitalis is a poison assuredly as indeed are practically all remedial agents that are derived from plants or minerals, but they are poisonous only in doses which the physician does not prescribe. In the small doses and in the kind of preparations ordered by doctors these



drugs are not dangerous. Quite the contrary! They are so helpful that they often are a means of saving life. This certainly is true of digitalis and certain other remedies that act in essentially the same manner as digitalis.

When the heart is unable to contract strongly and on account of its dilatation is too rapid or too feeble to expel its contents well enough to keep up good circulation, digitalis will slow down the heart and strengthen its contractions. By slowing the heart it permits more time both for the better filling of its chambers and for needed rest. In other words, it is a heart energiser and a heart tonic. It is thought by some people to be a stimulant to the heart and harmful because it may over-stimulate.

Digitalis is not a stimulant because a stimulant is something that gives only transient and artificial strength, the false sense of strength being usually succeeded by just the opposite feeling or a sense of weakness and need for a repetition of the stimulant. Alcohol is precisely such a stimulant. Digitalis gives the feeble heart actual, not false, increase of strength or tone, as we say. By assisting the dilated heart to perform its work more efficiently, it helps the heart to regain compensatory hypertrophy, just the opposite condition to dilatation. Untold thousands of individuals

are alive to-day, and perhaps you may be one of them, who owe their lives to this invaluable remedy.

But perhaps you say, "I have no objection to taking it or any other medicine when my life is in danger, but why should I keep on taking it after all danger is past and my heart is again working all right?" If in reality your heart is working all right you probably do not require digitalis, but the situation with a good many persons is just this: Their heart muscle is not strong enough to do good work day after day, but as time goes on begins to show to the physician infallible indications of losing ground. It needs help. Under such circumstances digitalis is often the very tonic needed. It is for the weakened heart just what a crutch is to a weak leg. Taken regularly it is a food, a tonic, a prop, whatever one may choose to call it, and may be relied on for years even to keep the heart pumping and pumping steadily and strongly. Even if you do have to depend on digitalis or some similar remedy day in and day out, is it not preferable to depending on unaided nature when nature is unequal to keeping you alive and able to enjoy life? You have to take food regularly for your body, why object to this food for your heart?

There is no intention of conveying the idea

that in taking digitalis or any other cardiac tonic you are to rely on it to the exclusion of other means. By some persons it seems to be thought they absolve themselves of all responsibility when they call a doctor and take his medicine. They go on in the same old way, keeping about and failing to rest as much as may be necessary and in other respects not obeying instructions strictly. Do not place all the responsibility for the care of your heart or that of your child on the doctor, but aid him in every way you can.

**CATHARTICS.** Physicians often see fit to order a physic and patients sometimes object on the ground that they have a regular daily action of the bowel and do not see the need of a cathartic. Purgation relieves congestion in the liver and other abdominal structures and is indispensable in many cases, particularly when there is dropsy or a marked tendency thereto.

Inability on the part of the heart to drive the blood forward efficiently, whether because of a valve trouble or of dilatation, acts as does a dam across a river. This is especially true of mitral stenosis. If the water in the river can not pass the dam as rapidly as it comes to it, the result is a flooding of the fields above the obstruction. Consequently, what does one have to do to relieve the overflowed meadows when he can not

tear away the dam? Why, he digs a ditch and carries the water off around the point of obstruction.

The above simile explains exactly what we doctors try to do when the obstruction to the circulation threatens to inundate the lungs and other tissues representing the fields above the dam in the river. The cathartic is the ditch through which the excess of water can be diverted.

When you with some form of heart disease, especially with mitral disease, find you are getting shorter of wind than usual, take a physic that will produce a few watery evacuations and see how relieved you will feel. And if you are beginning to be water-logged from dropsy and the doctor orders what seems to you like a very drastic kind of treatment, do not object but take the dose like a hero in faith that it will benefit you.

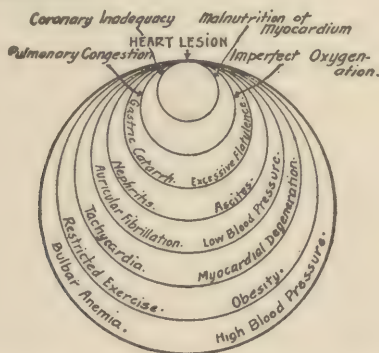
Lastly, with respect to the use of artificial means for the increased action of the bowel, do not allow yourself to become constipated. It is baneful in more ways than one. It not only tends to aggravate a tendency to swelling of the veins of the legs and interior of the abdomen, but it promotes straining at stool and this bearing down effort may prove too great a strain for your right ventricle and increase your tendency to breathlessness.

CHANGE OF CLIMATE is not exactly a remedy for persons with weak hearts, since it possesses no curative properties in itself. But to seek a mild, equable climate is a measure of great good to many individuals. It is especially to be recommended for old people and indeed for any one whose heart, kidney or arterial disease seems to favour colds and coughs in consequence of chronic bronchial congestion. Unfortunately all such individuals can not avail themselves of this agreeable change during inclement months, and when they can not they should keep indoors in stormy weather and not expose themselves needlessly to the risk of taking cold. If you are elderly or if you have a serious mitral disease, your resistance is lowered and you are more liable to bronchitis or still worse to pneumonia than is a perfectly healthy person. And this leads naturally to the injunction, never neglect a cold or so-called grippe attack on the supposition that you can "throw it off." Persons of middle age or over and indeed persons with too high blood pressure and stiff arteries do not always throw off what to them seem trifling ailments as would younger individuals whose circulation is unimpaired, that is, who have no serious changes in some part of their circulatory system. If you get a cold that creates cough and tightness in your chest, go to bed and



send for your doctor. Taken in time it may not prove serious, but neglected it may cost you your life or many days of grave sickness.

Finally as a last injunction let it be impressed on you the great remedial benefit of *rest*. Aside from digitalis there is no measure in the management of weak hearts equal to rest, and by this is meant not partial rest, but actual rest in bed or on a couch. If you have had a hard week and your breathing is not quite so easy as before, take a good rest over Sunday and do not whip up your jaded heart to attend church or places of amusement or by visiting some friend, but lie down and sleep or at least get all the rest of mind and body you can, remembering that body-rest is also heart-rest and heart-rest may mean the prevention of heart-exhaustion.



SHOWING SOME OF THE POSSIBILITIES OF A  
PROGRESSIVE HEART LESION

(1)





## BOOKS ON HEALTH AND HYGIENE

### THE HOME MEDICAL ADVISER

By KENELM WINSLOW, M.D. \$5.00

A complete, up-to-date and helpful book that is invaluable in the home. Information on all diseases that occur under home conditions and their remedies, in simple language. Illustrated.

### BLOOD PRESSURE

By LEWELLYS F. BARKER, M.D., and  
NORMAN COLE, M.D. \$1.25

What the layman wants to know on a subject of increasing interest.

### GOOD HEALTH

By ALVAH H. DOTY, M.D. \$2.00

Tells the person not in good health how to get it and how to keep it once it has been obtained. Illustrated.

### WALKING FOR HEALTH

By ALVAH H. DOTY, M.D. \$.50

The best and most available way to keep in trim.

### HANDBOOK OF HEALTH AND HOW TO KEEP IT

By WALTER CAMP \$1.25

A sane, universally available system, whereby one may keep himself normally fit, whether he be child or adult, scholar or ditch digger.

### HOW TO REDUCE—New Waistlines for Old

By ANTOINETTE DONNELLY \$1.00

An expert writes in pithy paragraphs of how to secure slimness without making a martyr of oneself. Illustrated.

### CARE OF THE SKIN AND HAIR

By WILLIAM A. PUSEY, M.D. \$1.50

A popular discussion, by a specialist, on hair and skin hygiene, with simple methods for keeping both healthy and ornamental.

### CARE OF THE TEETH

By S. A. HOPKINS, M.D., D.D.S. \$1.25

This practical guide to the care of the teeth is written with a view to the actual needs of the family.

---

D. APPLETON AND COMPANY

New York

London



















WG 113 B112y 1924

38110110R



NLM 05187638 0

NATIONAL LIBRARY OF MEDICINE